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Workshop Manual

Octavia II 2004 ➤ , Octavia II 2010 ➤ ,
Rapid NH 2013 ➤ , Rapid NH 2014 ➤ ,
Superb II 2008 ➤ , Superb II 2011 ➤ ,
Yeti 2010 ➤ , Yeti 2011 ➤

1.4/90, 92 kW TSI engine									
Engine ID	CAX A	CAX C							

Edition 11.2015

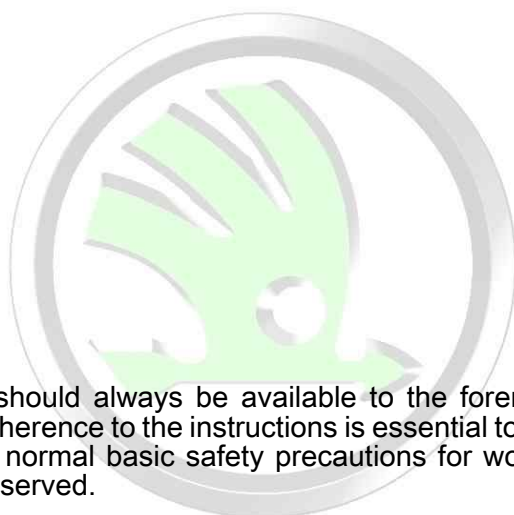
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Technical information should always be available to the foremen and mechanics, because their careful and constant adherence to the instructions is essential to ensure vehicle road-worthiness and safety. In addition, the normal basic safety precautions for working on motor vehicles must, as a matter of course, be observed.

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00 – Technical data

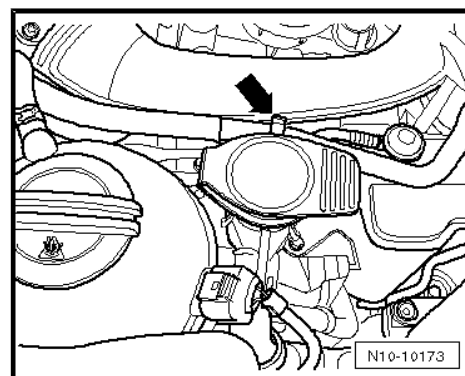
1 Identification

(SRL000888; Edition 11.2015)

⇒ [“1.1 Engine number, engine data”, page 1](#)

1.1 Engine number, engine data

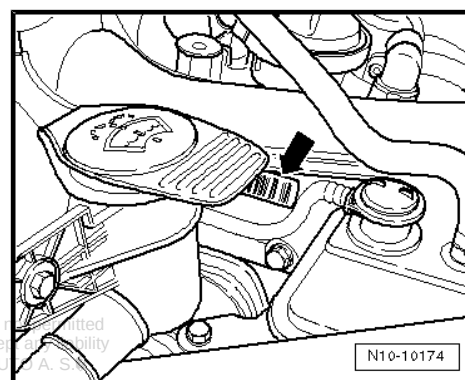
- Unhook hose from activated charcoal filter at the hose clip -arrow-.



The “engine identification characters” and “serial number” can be found on the sticker -arrow- on the timing case.

The “engine identification characters” are also provided on the vehicle data carrier and on the crankcase above the gearbox.

- ◆ The “engine identification characters” have 4 digits starting with the letter “C”.
- ◆ The first 3 digits of the “engine identification characters” refer to the displacement and the mechanical construction of the engine. They are type-punched on the cylinder block including the serial number.
- ◆ The 4th digit refers to the output and torque of the engine and depends upon the engine - J623- control unit.



- ◆ ⇒ Maintenance ; Booklet Octavia II .
- ◆ ⇒ Maintenance ; Booklet Superb II .
- ◆ ⇒ Maintenance ; Booklet Yeti .
- ◆ ⇒ Maintenance ; Booklet Rapid NH .

Engine identification characters		CAXA	CAXC
Manufactured	Octavia II	11.2008 ► 06.2013	- - -
	Superb II	- - -	08.2008 ► 08.2015
	Yeti	06.2010 ► 05.2015	- - -
	Rapid NH	11.2012 ► 05.2015	- - -
Exhaust limit values conforming to		EU-4 ¹⁾ , EU-5	EU-4 ¹⁾ , EU-5
Displacement	cm ³	1390	1390
Power output	kW at rpm	90/5000	92/5000
Torque	Nm at rpm	200/1500-4000	200/1500-4000
Bore	Ø mm	76,5	76,5



Engine identification characters		CAXA	CAXC
Stroke	mm	75,6	75,6
Compression ratio		10:1	10:1
Cylinder / valves per cylinder		4/4	4/4
RON		95 unleaded ²⁾	95 unleaded ²⁾
Ignition system/fuel injection		Motronic MED 17.05.20	Motronic MED 17.05.20
Type of fuel preparation		Direct injection homo- geneous	Direct injection homo- geneous
Knock control		1 sensor	1 sensor
Lambda control		2 Lambda probes	2 Lambda probes
Three-way catalytic converter		yes	yes
Exhaust gas recirculation		no	no
Intake manifold change-over		no	no
Camshaft adjustment		yes	yes
Secondary air system		no	no
Exhaust gas turbocharger		yes	yes

¹⁾ According to EU-5.

²⁾ At least 91 RON in exceptional cases, although engine output is reduced.

2 Safety instructions

⇒ [“2.1 Safety precautions when working on fuel supply system”, page 3](#)

⇒ [“2.2 Safety precautions when working on vehicles with a start/stop system”, page 4](#)

⇒ [“2.3 Safety precautions during road tests in which testing and measuring equipment is used”, page 5](#)

⇒ [“2.4 Safety precautions when working on cooling system”, page 5](#)

⇒ [“2.5 Safety precautions when working on ignition system”, page 6](#)

⇒ [“2.6 General safety instructions”, page 6](#)

2.1 Safety precautions when working on fuel supply system

**WARNING**

Fuel under high pressure creates a risk of injury.

Leaking fuel creates a fire hazard.

- ◆ *The injection system consists of a high pressure part (max. pressure of 20 MPa = 200 bar) and a low pressure part (pressure of approx. 0.7 MPa = 7 bar).*
- ◆ *The fuel system is under pressure! Before opening the injection system high-pressure system, the fuel pressure must be reduced to residual pressure*
⇒ [“1.2 Reduce fuel pressure”, page 269](#) .
- ◆ *After the pressure has been reduced the connection point must be opened »immediately«. To do this place a cleaning cloth around the connection point to reduce the residual pressure (approximately 0.7 MPa = 7 bar).*
- ◆ *Wear protective gloves.*
- ◆ *Wear safety goggles.*
- ◆ *The fuel pump is activated by the door contact switch when the driver's door is opened. If the battery was disconnected, the voltage supply for the fuel pump must be disconnected for safety reasons.*

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**Caution**

There is a risk of destruction of electronic components when disconnecting the battery.

- ◆ *Observe measures when disconnecting the battery.*

Disconnect the voltage supply to the fuel pump

- ◆ By disconnecting the battery ⇒ Electrical system; Rep. gr. 27 .
- ◆ By removing the fuse for the control unit for the fuel pump - J538- ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.



- ◆ By removing the connector from the flange of the fuel delivery unit.



Caution

When undertaking all assembly work, particularly in the engine compartment due to its cramped construction, please observe the following:

- ◆ *Route all the various lines (e.g. for fuel, hydraulics, activated charcoal filter system, coolant and refrigerant, brake fluid and vacuum) and electrical wiring in their original positions.*
- ◆ *Ensure that there is adequate free access to all moving or hot components.*

Even slight contamination can lead to defects. For this reason it is essential to pay careful attention to the following rules of cleanliness when working on the fuel supply and on fuel injection systems:

- ◆ Clean connection points and their environment thoroughly with engine or brake cleaner and dry the cleaned area thoroughly before loosening.
- ◆ Open closed lines and connections immediately with suitable screen caps.
- ◆ Place removed parts on a clean surface and cover. Do not use fuzzy cloths.
- ◆ Only install clean components: Only unpack replacement parts immediately prior to fitting. Do not use any parts which have been stored unwrapped (e.g. in tool boxes etc.).
- ◆ When the system is open: Do not work with compressed air. Avoid moving the vehicle.
- ◆ Protect electrical plug connections from dirt and moisture and only connect them when dry.
- ◆ The extraction hose of an exhaust extraction system which is switched on, must be positioned close to the assembly opening of the fuel tank in order to extract the released fuel vapours, even before the work is commenced. If no exhaust extraction system is available, a radial fan (motor not in air flow of fan) with a delivery volume of more than 15 m³/h must be used.

2.2 Safety precautions when working on vehicles with a start/stop system

When working on vehicles with start/stop system, please observe the following:



WARNING

There is risk of injury from automatic engine starting on vehicles with start/stop system.

- ◆ *In vehicles with the start/stop system activated (identifiable by an indication in the dash panel insert) the engine can start automatically if required.*
- ◆ *It is therefore necessary to ensure that the start-stop system is deactivated when carrying out work on the vehicle (switch ignition off, if required switch ignition on again).*

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2.3 Safety precautions during road tests in which testing and measuring equipment is used

Note the following if testers and measuring instruments must be used during a road test:



WARNING

There is a risk of accident from deflection and insufficient securing of testers and measuring instruments.

There is also a hazard from the release of the passenger airbag in the event of an accident.

- *Using testers and measuring instruments during driving operation creates a risk of deflection.*
- *Increased risk of injury from unsecured testers and measuring instruments must be prevented.*
- ◆ *Testers and measuring instruments must always be secured on the rear seat using a seat belt and by a 2nd person on the rear seat.*

2.4 Safety precautions when working on cooling system



WARNING

Hot steam may escape when the compensation bottle is opened.

- ◆ *Wear safety goggles and safety clothing, in order to avoid eye injuries and scalding.*
- ◆ *Cover cap with cloth and open carefully.*



Caution

When undertaking all assembly work, particularly in the engine compartment due to its cramped construction, please observe the following:

- ◆ *Route all the various lines (e.g. for fuel, hydraulics, activated charcoal filter system, coolant and refrigerant, brake fluid and vacuum) and electrical wiring in their original positions.*
- ◆ *To avoid damage to lines, ensure sufficient clearance from all moving or hot components.*

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**Note**

- ◆ *When the engine is warm the cooling system is under pressure. If necessary reduce pressure before repairs.*
- ◆ *Secure all hose connections with hose clamps, assignment ⇒ Electronic Catalogue of Original Parts "ETKA".*
- ◆ *Hose clip pliers - VAS 6362- are recommended to install spring-type clips.*
- ◆ *Always replace seals and gasket rings.*
- ◆ *When installing fit the coolant hoses free of stress, without them touching any other components (pay attention to the marking on the coolant connection and hose).*

2.5 Safety precautions when working on ignition system

**WARNING**

To prevent injuries to persons and/or damage to the injection and ignition system, please observe the following:

Do not touch or disconnect ignition cables when the engine is running or being turned at starter speed.

Switch off ignition before connecting or disconnecting injection and ignition system wiring as well as test instrument cables.

The fuel delivery unit is activated when the ignition is switched on and by the door contact switch of the driver door. Therefore, if the battery power hasn't been disconnected, for safety reasons the plug of the fuel delivery unit must be disconnected, or the fuel pump fuse must be removed before opening the fuel system.

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2.6 General safety instructions

**WARNING**

The fuel system is under pressure! Place a clean cleaning cloth around the connection point before detaching hose connections. Reduce pressure by carefully removing the hose.

*The safety measures for the pressure reduction in the high pressure system must be observed
⇒ "1.2 Reduce fuel pressure", page 269 .*

To prevent injuries to persons and/or damage to the injection and ignition system, the following must be observed:

- ◆ Do not touch or disconnect ignition cables when the engine is running or being turned at starter speed.
- ◆ Ignition must be switched off before disconnecting and re-connecting the cables of the fuel injection and the ignition system as well as of the test equipment.
- ◆ If the engine must be operated at start speed without it starting, as for example, when checking the compression pressure, remove the fuse for the voltage supply of the injection valves and the ignition coils from the fuse holder ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.

If test and measuring devices are required during test drives, follow

⇒ "2.3 Safety precautions during road tests in which testing and measuring equipment is used", page 5 .



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3 Repair instructions

⇒ **"3.1 Rules of cleanliness", page 8**

⇒ **"3.2 Foreign bodies in the engine", page 8**

⇒ **"3.3 Contact corrosion", page 8**

⇒ **"3.4 Cable routing and securing", page 8**

⇒ **"3.5 Assembly of radiators and capacitors", page 9**

3.1 Rules of cleanliness

Carefully observe the following "rules" for cleanliness when working on the fuel supply/injection system:

- ◆ Thoroughly clean the connection points and their surroundings before releasing.
- ◆ Place removed parts on a clean surface and cover. Do not use fuzzy cloths.
- ◆ Carefully cover or close opened components if the repair is not completed immediately.
- ◆ Only install clean components: Only unpack replacement parts immediately prior to fitting. Do not use any parts which have been stored unwrapped (e.g. in tool boxes etc.).
- ◆ When the system is open: Do not work with compressed air. Do not move vehicle.
- ◆ Ensure that no fuel runs onto the fuel hoses. If happens, clean the hoses immediately.
- ◆ Protect electrical plug connections from dirt and moisture and only connect them when dry.

3.2 Foreign bodies in the engine

To prevent the penetration of foreign bodies, open channels of the inlet connection and exhaust tract must be sealed with suitable plugs during assembly works on the engine, for example from the screw plug set for engine - VAS 6122- .

3.3 Contact corrosion

The use of unsuitable connection elements (screws, nuts, washers, ...) causes contact corrosion.

This is why only connection elements with a special surface coatings are fitted.

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Therefore, the rubber or plastic parts and the adhesives are made from electrically non-conductive materials.

If you have any doubts about the suitability of parts, please use new parts in general ⇒ Electronic Catalogue of Original Parts "ET-KA".

3.4 Cable routing and securing

- ◆ To ensure the original installation position, e.g. lines for fuel, hydraulics, vacuum, activated charcoal filter system lines or electric cables must be marked before removal. Make photos or sketches where necessary.
- ◆ Sufficient clearance from all moving or hot components must be ensured in the engine compartment due to its cramped construction. This prevents damage to lines.

3.5 Assembly of radiators and capacitors

The radiator, capacitor and charge air cooler may have minor indentations on the fins, even if assembly is correct. This is not a case of damage. Radiator, capacitors or charge air cooler must not be replaced because of these indentations.

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10 – Removing and installing engine

1 Removing and installing engine

⇒ [“1.1 Removing engine”, page 10](#)

⇒ [“1.2 Disconnect engine and gearbox”, page 28](#)

⇒ [“1.3 Attach engine attached to engine and gearbox mount”, page 29](#)

⇒ [“1.4 Installing the engine”, page 30](#)

1.1 Removing engine

⇒ [“1.1.1 Removing engine \(Octavia II, Superb II and Yeti\)”, page 10](#)

⇒ [“1.1.2 Removing the engine \(Rapid NH\)”, page 18](#)

1.1.1 Removing engine (Octavia II, Superb II and Yeti)

Special tools and workshop equipment required

- ◆ Engine and gearbox jack . e.g. -V.A.G 1383A-
- ◆ Double ladder , e. g. -VAS 5085-
- ◆ Engine mount (rigid) - T40075A- or engine mount (swivelling) - T10416-
- ◆ Removal tool for inner lining of the door panel - MP 8-602/1-
- ◆ Pliers for spring strap clips , e.g. -VAS 6340-
- ◆ Catch pan for workshop crane , e.g. -VAS 6208-



Note

- ◆ *The engine is removed downwards together with the gearbox.*
- ◆ *All cable straps that have been loosened or cut open when the engine was removed must be attached again in the same location when the engine is installed again.*
- ◆ *Leave the ignition key in the ignition lock so that the steering lock does not click into place.*
- ◆ *Collect drained coolant in the container for proper disposal.*
- ◆ *Observe the disposal instructions.*



Caution

When undertaking all assembly work, particularly in the engine compartment due to its cramped construction, please observe the following:

- ◆ *Route all the various lines (e.g. for fuel, hydraulics, activated charcoal filter system, coolant and refrigerant, brake fluid and vacuum) and electrical wiring in their original positions.*
- ◆ *In order to avoid damage to the cables, ensure that there is adequate free access to all moving or hot components.*

Observe all safety measures and notes for assembly work on the fuel system, on the injection and ignition system and the charge air system as well as rules for cleanliness
⇒ [“2 Safety instructions”, page 3](#) .



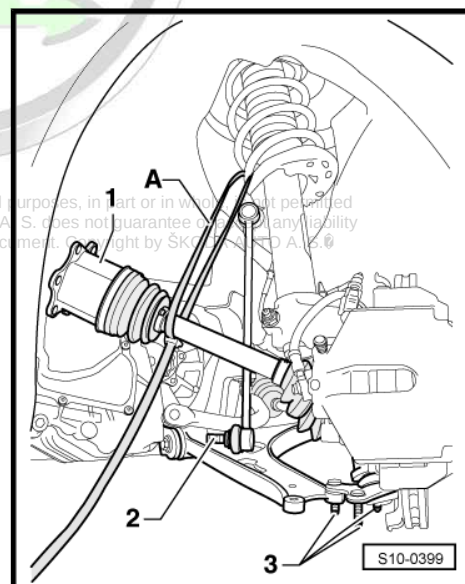
WARNING

Fuel under very high pressure creates a risk of injury.

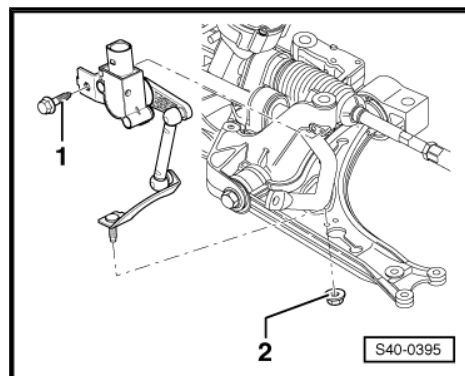
- ◆ *Before opening the injection system high-pressure system, the fuel pressure must be reduced to residual pressure ⇒ [“1.2 Reduce fuel pressure”, page 269](#) .*

- Remove engine cover
⇒ [“3.1 Removing and installing engine trim panel”, page 48](#) .
- Remove air filter housing
⇒ [“3.2.1 Removing and installing air filter housing \(Octavia II, Superb II, Yeti\)”, page 277](#) .
- Before disconnecting the battery, if necessary remove the adapter for the anti-theft wheel bolts from the luggage compartment.
- Remove battery and battery tray ⇒ Electrical System; Rep. gr. 27 .
- Remove the right and left wheelhouse liner ⇒ Body Work; Rep. gr. 66 .
- Drain the coolant from the cooling system and the charge air cooling system
⇒ [“1.3 Draining and filling coolant”, page 155](#) .
- Remove drive shaft to the right ⇒ Chassis; Rep. gr. 40 .
- Unscrew the left drive shaft from the flange shaft of the gearbox.
- Unscrew the nut from the left coupling rod -2- and press off the coupling rod from the anti-roll bar.
- Unscrew the nuts for the left steering joint -3- and press the steering joint out of the suspension arm.

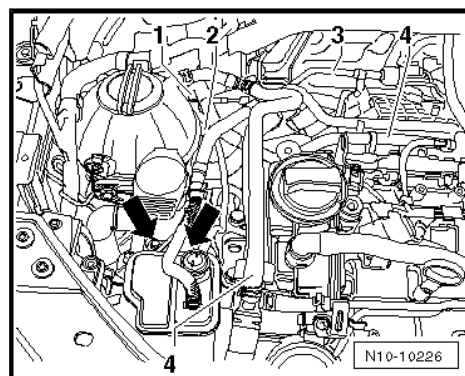
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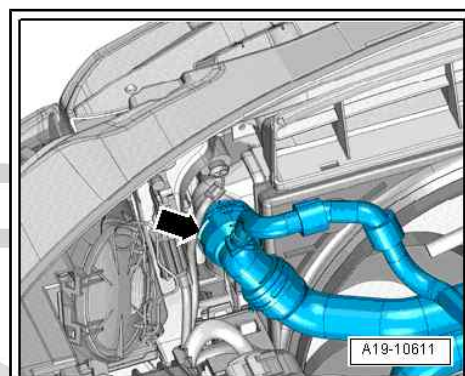
- Unscrew the nut -2- from the track control arm on installed front left vehicle level sensor - G78- .
- Turn steering to full left lock.
- Swivel the steering joint outwards and secure the drive shaft -1- with strap -A- in the wheelhouse.
- Place a stud screw in the suspension arm in order to stabilise the steering joint.



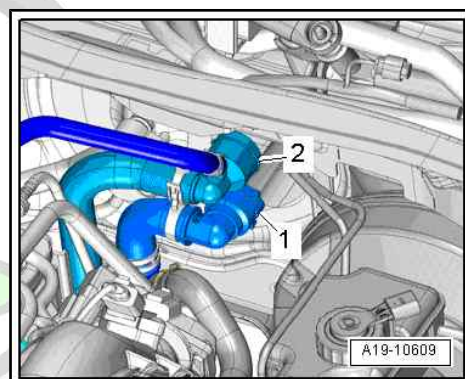
- Disconnect the fuel feed line -1- and the line to the activated charcoal filter -2-
⇒ [“3.1 Separating quick couplings”, page 207](#) .
- Remove hose -3- from the activated charcoal filter solenoid valve 1 - N80- from the activated charcoal filter.
- Pull activated charcoal filter upwards and unscrew the fixing screws -arrows- of the bracket.
- Pull off coolant hoses -4-.



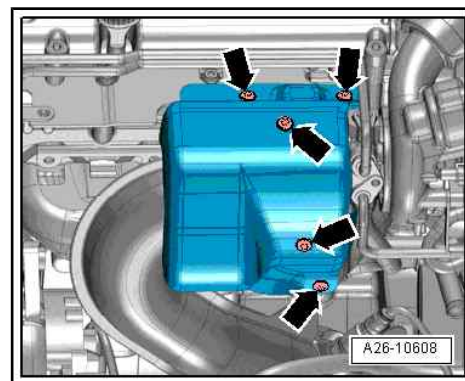
- Unlock and pull off coolant hose -arrow- at the radiator top left.



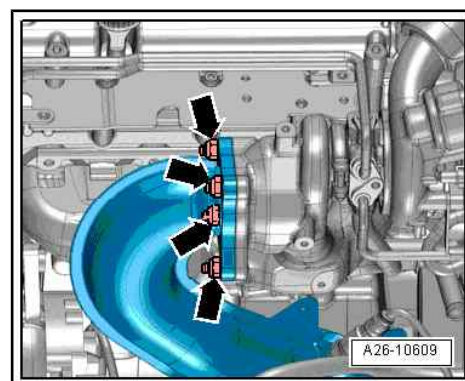
- Unlock and pull off coolant hoses -1- and -2- at the heat exchanger.



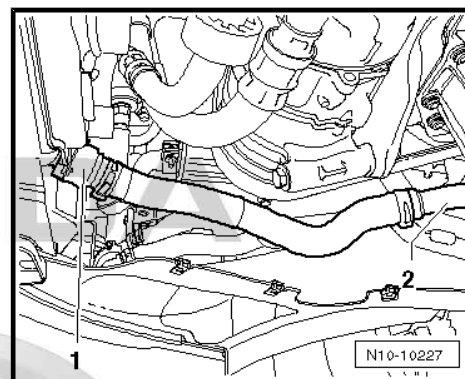
- Release fixing screws -arrows- and remove the heat shield from the exhaust turbocharger.



- Unscrew fixing nuts -arrows- at exhaust gas turbocharger.



- Remove coolant pipe -2-.

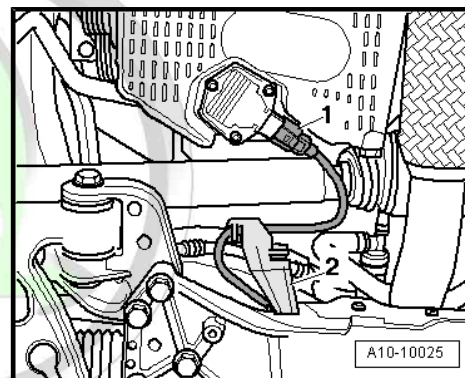


- Disconnect plug -1- at the oil level and oil temperature sender - G266- .
- Unclip bracket -2- for electric cable of the oil level and oil temperature sender - G266- from the support on the assembly carrier.

Vehicles with auxiliary heating.

- Position drip tray e.g. -VAS 6208- under the auxiliary heating.
- Remove coolant pipe -2-.

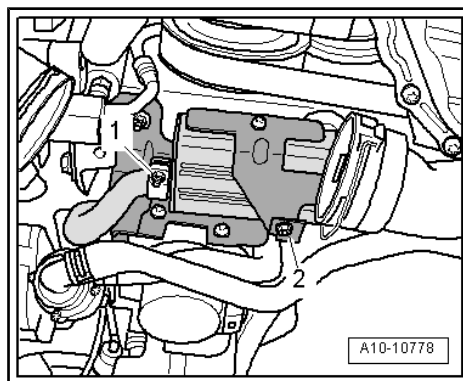
Only for auxiliary heating with extended pre-exhaust pipe



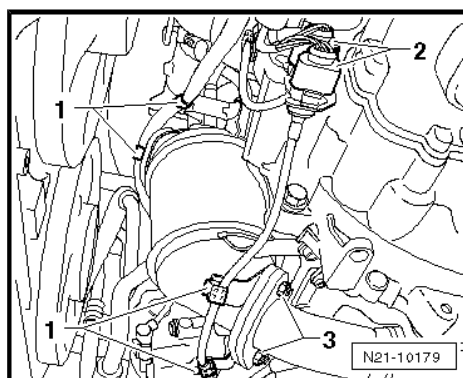


- Unscrew clamp -1- and remove screw -2-.
- Detach the pre-exhaust pipe of the auxiliary heating and additional heating.

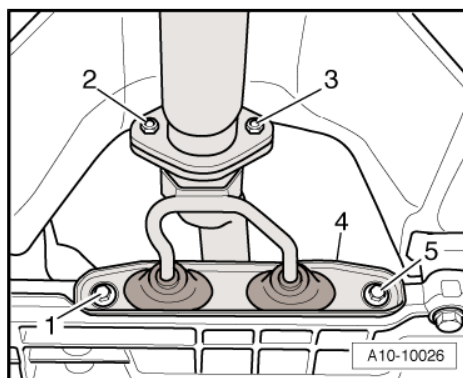
Continued for all vehicles



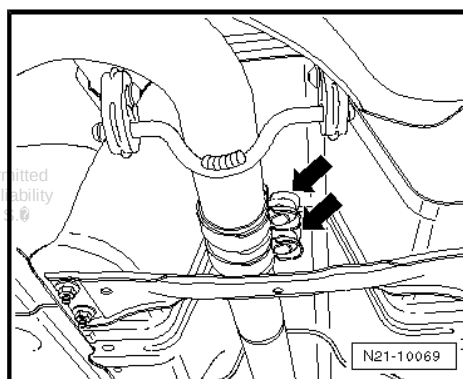
- Expose line -1- on the catalytic converter.
- Disconnect plug connections -2-.
- Unscrew fixing nuts -3- and remove the gasket.
- Remove catalytic converter downwards.



- Unscrew fixing nuts -2- and -3- and remove the gasket.
- Unscrew screws -1- and -5- and remove pre-exhaust pipe with bracket -4-.

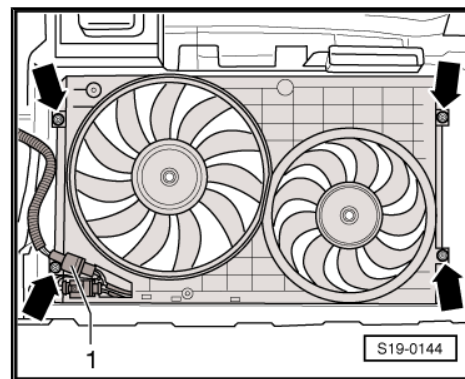


- Loosen clamping sleeve fixing screws -arrows- and pull the exhaust system intermediate pipe backwards.
- Disconnect all electrical lines from the gearbox, generator and starter motor and expose them.
- Remove/unclamp all other necessary electrical cables from the engine and expose them.
- Disconnect the vacuum and bleeder hoses from the engine.

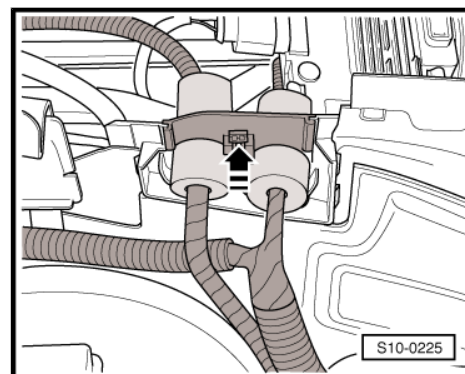


- Disconnect plug -1- from thermo-switch and radiator fan.
- Disconnect the plug of the engine wiring harness from the engine control unit (front plug):

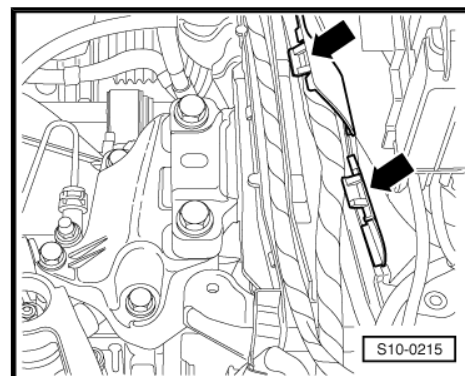
- ◆ Octavia II
⇒ ["6.1.1 Removing and installing engine control unit J623 \(Octavia II\)", page 292](#) .
- ◆ Superb II and Yeti
⇒ ["6.1.2 Removing and installing engine control unit J623 \(Superb II, Yeti\)", page 293](#) .



- Release guide for engine wiring harness and pull out upwards -arrow-.



- Open all fuses for the engine wiring harness at frame side rail -arrows-.
- Open other attachments of the engine wiring harness, remove engine wiring harness and attach to engine.
- Attach the cables with a cable strap at the engine.
- Remove pendulum support
⇒ ["2.4.1 Removing and installing pendulum support \(Octavia II, Superb II, Yeti\)", page 43](#) .



For models with automatic gearbox

- Remove the selector lever control cable from the gearbox ⇒ Gearbox; Rep. gr. 34 .

For vehicles with manual gearbox

- Remove shift mechanism from gearbox ⇒ Gearbox; Rep. gr. 34 .
- Remove hydraulic slave cylinder of the hydraulic clutch ⇒ gearbox; Rep. gr. 30 and strap it up to the side. Do not open line system.



Caution

After removing the slave cylinder, do not depress the clutch pedal. Doing so may damage the slave cylinder.

Continued for all vehicles

- Put lock carrier in service position ⇒ Body Work; Rep. gr. 50 .

- Detach the coolant hoses -3- from the coolant recirculation pump - V50- .
- Loosen spring strap clips -arrows- and remove coolant hoses.
- Unscrew fixing screw -2- and take the pump out of the bracket.
- Unscrew screws -1- from the coolant recirculation pump - V50- bracket from the cylinder block.

Vehicles with air conditioning

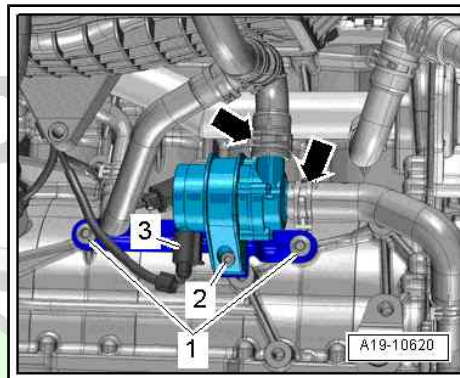
- Remove V-ribbed belt
⇒ ["1.3 Removing and installing V-ribbed belt", page 54](#) .



WARNING

Risk of injury through refrigerant.

- ◆ *Do not open the refrigerant circuit of the air conditioning system.*



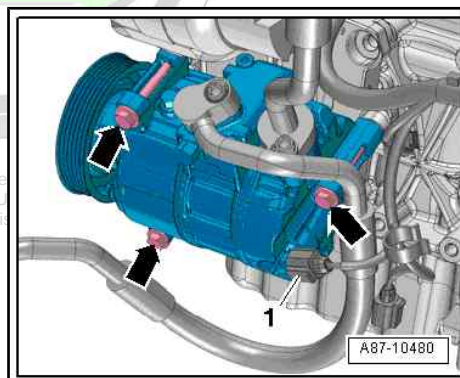
- Disconnect electric plug connection -1- on the control valve for the air conditioning system - N280- compressor.
- Release screws -arrows- for AC compressor.



Caution

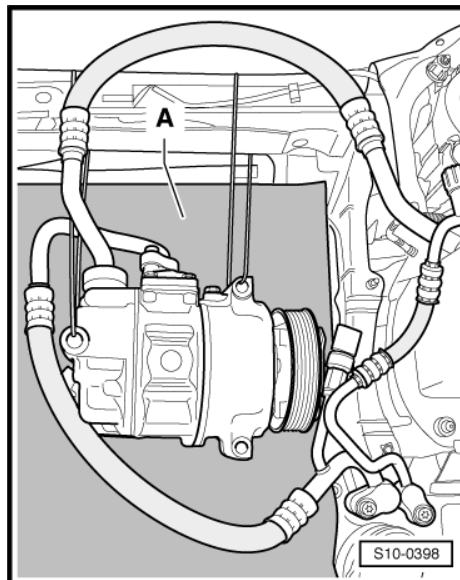
Risk of damaging AC compressor, refrigerant lines and hoses.

- ◆ *Do not over-tension, buckle or bend refrigerant lines and hoses.*

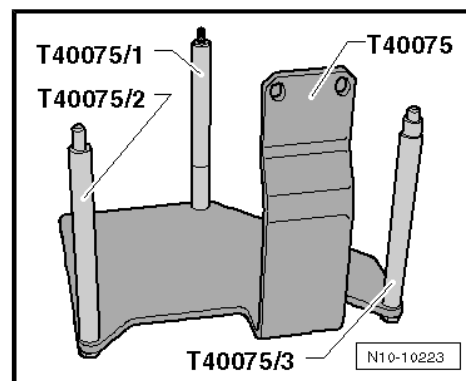


- Secure AC compressor to the lock carrier with connected hoses. Insert a sheet of cardboard -A- when doing so to protect the radiator.

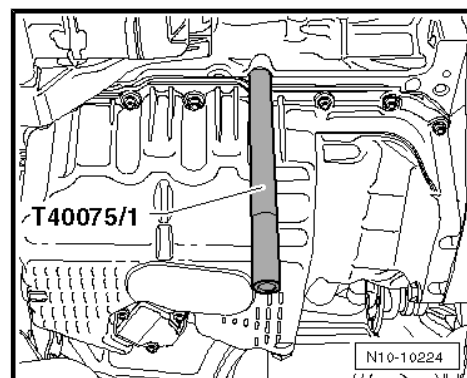
Continued for all vehicles



In order to lower the engine, the engine mount - T40075A- with the adapters -/1-, -/2- and -/3- is required.



- Turn the adapter - T40075/1- up to the stop in the cylinder block.

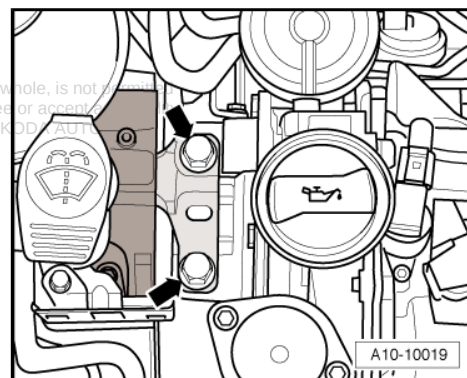
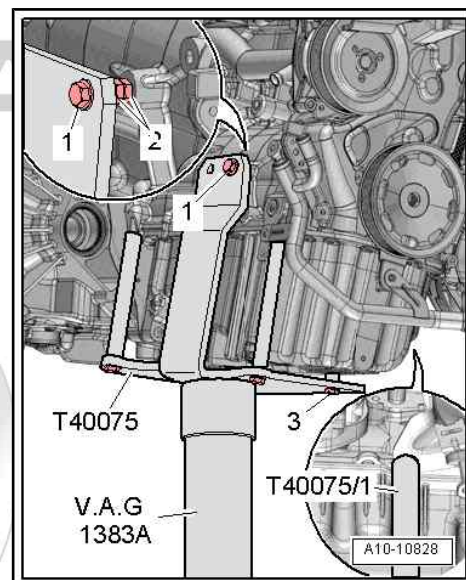


- Position engine mount - T40075A- with adapters -/2- and -/3- on the cylinder block and screw on with screw -3- using adapter - T40075/1- .
- Insert two nuts M10 -2- between cylinder block and engine mount - T40075A- .
- Secure engine mount - T40075A- using screw M8 x 35 -1- to the cylinder block hand-tight.
- Tighten all screws on engine mount - T40075A- to specified torque ➔ [page 18](#) .
- Slightly raise the engine and gearbox with the engine and gearbox jack - V.A.G 1383A- .



Note

- ◆ *Check whether all hose and line connections between engine, gearbox and body are released.*
- ◆ *Use the double ladder, e.g. -VAS 5085- for removing the fixing screws.*
- Unscrew assembly bracket on the engine side from above -arrows-.



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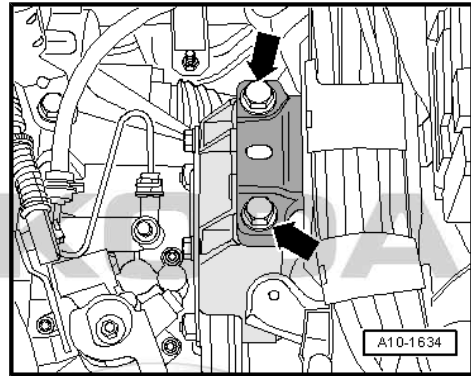
- Unscrew assembly bracket on the gearbox side from above -arrows-.



Caution

Risk of damaging vacuum lines or electric cables of the engine compartment.

- ◆ Check that all vacuum lines and electric cables between engine, gearbox and body have been loosened.
- ◆ Guide the engine/gearbox unit out of the engine compartment carefully when lowering.



Note

The engine/gearbox assembly should be lowered with the help of a second mechanic.

- Pull engine/gearbox unit as far forward as possible and lower slowly downwards.

Tightening torques

Component	Specified torque
Screws on engine mount - T40075A-	20 Nm

1.1.2 Removing the engine (Rapid NH)

Special tools and workshop equipment required

- ◆ Engine and gearbox jack . e.g. -V.A.G 1383A-
- ◆ Double ladder , e. g. -VAS 5085-
- ◆ Engine mount (swivelling) - T10416- or engine mount (rigid) - T40075A-
- ◆ Removal tool for inner lining of the door panel - MP 8-602/1-
- ◆ Pliers for spring strap clips , e.g. -VAS 6340-
- ◆ Catch pan for workshop crane , e.g. -VAS 6208-



Note

- ◆ The engine is removed downwards together with the gearbox.
- ◆ All cable straps that have been loosened or cut open when the engine was removed must be attached again in the same location when the engine is installed again.
- ◆ Leave the ignition key in the ignition lock so that the steering lock does not click into place.



Caution

When undertaking all assembly work, particularly in the engine compartment due to its cramped construction, please observe the following:

- ◆ *Route all the various lines (e.g. for fuel, hydraulics, activated charcoal filter system, coolant and refrigerant, brake fluid and vacuum) and electrical wiring in their original positions.*
- ◆ *In order to avoid damage to the cables, ensure that there is adequate free access to all moving or hot components.*

Observe all safety measures and notes for assembly work on the fuel system, on the injection and ignition system and the charge air system as well as rules for cleanliness

⇒ ["2 Safety instructions", page 3](#) .



WARNING

Fuel under very high pressure creates a risk of injury.

- ◆ *Before opening the injection system high-pressure system, the fuel pressure must be reduced to residual pressure ⇒ ["1.2 Reduce fuel pressure", page 269](#) .*

- Remove engine cover
⇒ ["3.1 Removing and installing engine trim panel", page 48](#) .

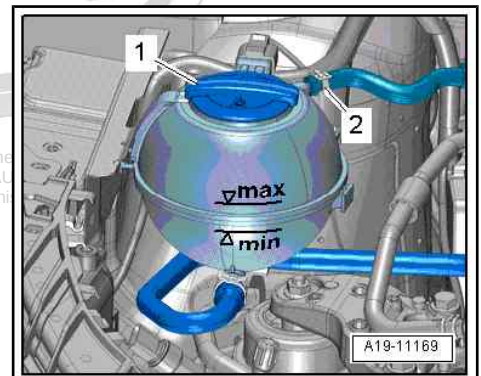


WARNING

Danger of scalding due to hot steam and hot coolant.

- ◆ *When the engine is warm the cooling system is under pressure.*
- ◆ *Reduce pressure by covering the cap of the coolant expansion tank with a cloth and opening it carefully.*

- Open the cap -1- of the coolant expansion reservoir.
- Loosen hose clamp -2- and remove coolant hose.



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- Remove the sound dampening system -1- ➔ Body Work; Rep. gr. 66 .
- Remove the right and left wheelhouse liner ➔ Body Work; Rep. gr. 66 .



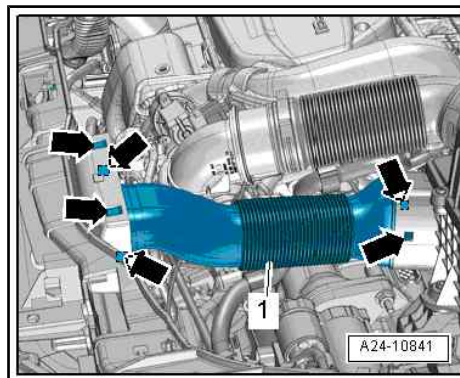
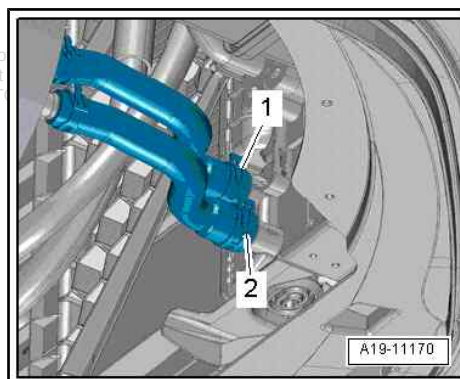
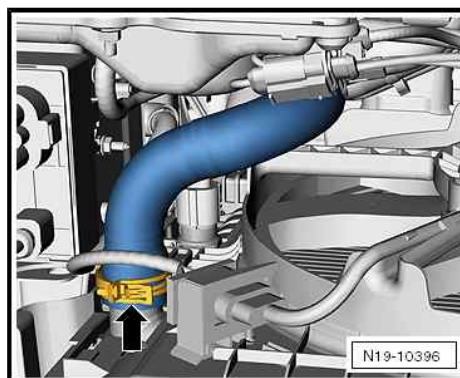
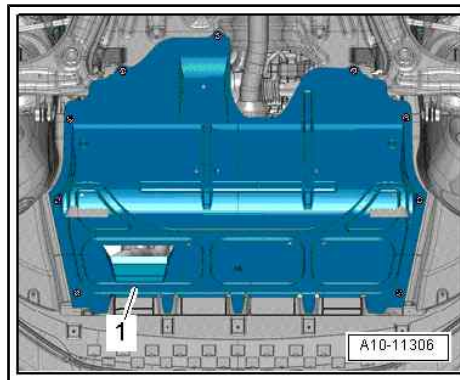
Note

- ◆ Collect drained coolant in the container for proper disposal.
- ◆ Observe the disposal instructions.

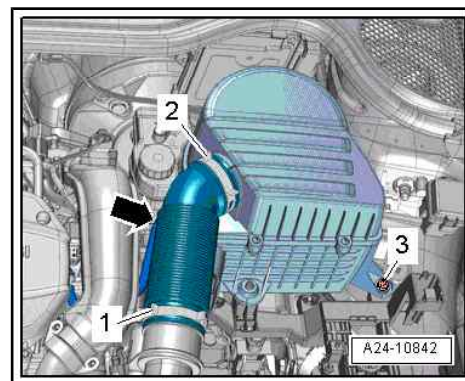
- Position drip tray e.g. -VAS 6208- under the engine.
- Loosen holding clamp -arrow-, remove bottom right coolant hose from radiator, allow coolant to drain.

- Loosen hose clamps -1- and -2- and disconnect bottom right hoses from additional radiator for coolant from the charge air cooling system.

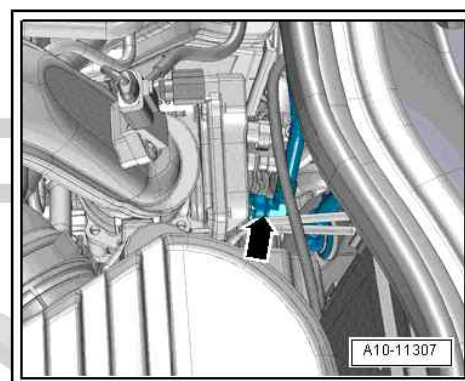
- Unlock catches -arrows- and remove air guide -1-.



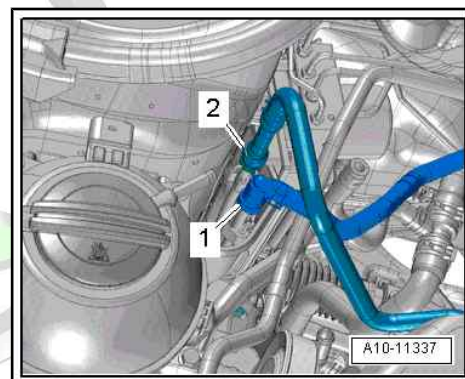
- Loosen hose clamp -1- and remove air guide hose from the inlet connection.
- Detach the vacuum hose -arrow- from the brake servo unit.
- Unscrew screw -3- and pull off air filter housing with connected air guide hose.
- Remove battery and battery tray ⇒ Electrical System; Rep. gr. 27 .



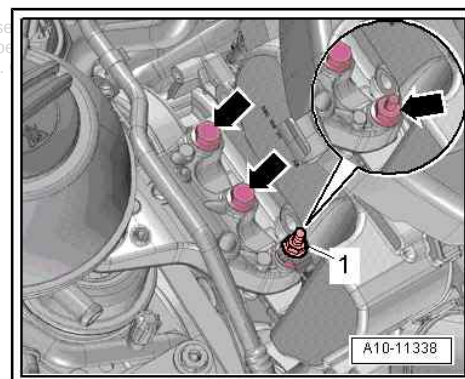
- Remove vacuum hose -arrow-. Press release buttons to do so.



- Remove vacuum hose -1- from activated charcoal filter. Press release buttons to do so.
- Remove fuel feed line -2- ⇒ ["3.1 Separating quick couplings", page 207](#) .
- Close open lines with clean plug for example from the set - VAS 6122- .

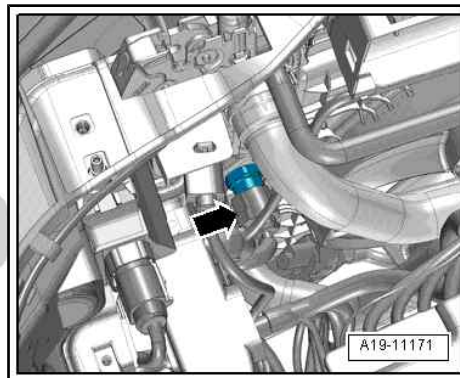


- Unscrew nut -1- and disconnect earth strap.
- Loosen screws -arrows- on engine mount by approximately 2 turns.

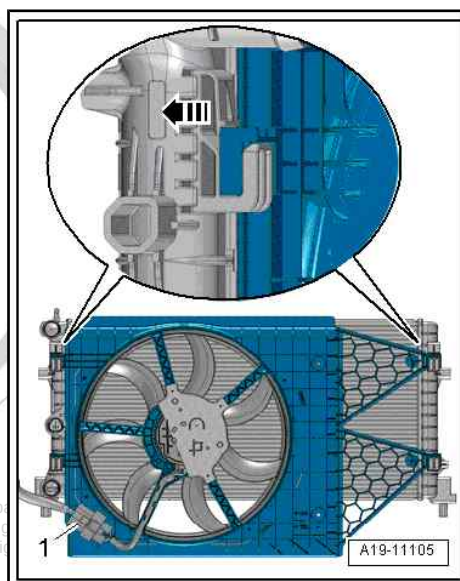




- Disconnect plug from coolant temperature sender at radiator outlet - G83- -arrow-.

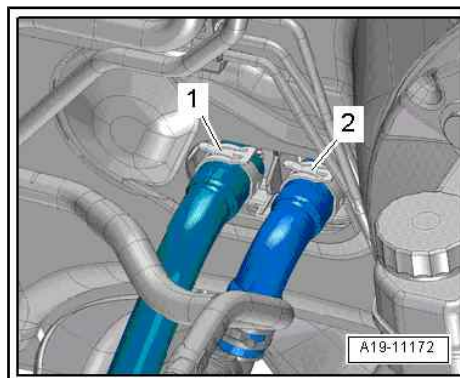


- Disconnect plug -1- from radiator fan.
- Press fan shroud locking lugs top left and right -arrow-, pull fan shroud upwards partially out of the supports and carefully remove the loosened fan shroud downwards.
- Loosen hose clamps.



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- Loosen hose clamps -1- and -2- and disconnect the coolant hoses from the heating heat exchanger.



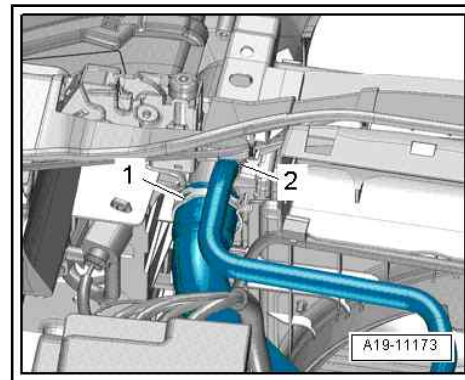
- Loosen hose clamps -1- and -2- and disconnect top left coolant hoses from coolant radiator.

For models with automatic gearbox

- Remove the selector lever control cable from the gearbox ⇒ Gearbox; Rep. gr. 34 .

For vehicles with manual gearbox

- Remove shift mechanism from gearbox ⇒ Gearbox; Rep. gr. 34 .
- Remove hydraulic slave cylinder of the hydraulic clutch ⇒ gearbox; Rep. gr. 30 and strap it up to the side. Do not open line system.

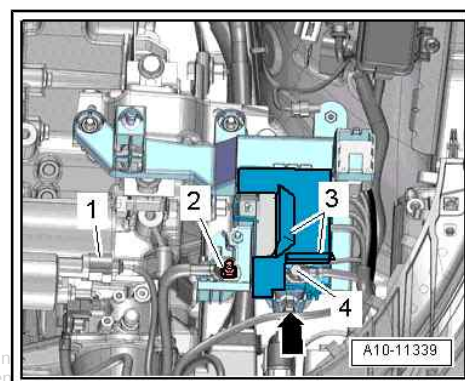


Caution

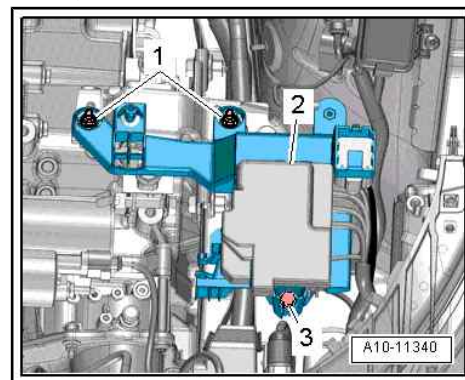
After removing the slave cylinder, do not depress the clutch pedal. Doing so may damage the slave cylinder.

Continued for all vehicles

- Put lock carrier in service position ⇒ Body Work; Rep. gr. 50 .
- Unplug plug -1- at starter.
- Open cover -3-.
- Unscrew nuts -2- and -4- and disconnect electric cables.



- Unscrew nuts -1- and screw -3- and push E-Box -2- to the side.
- Remove engine control unit
⇒ ["6.1.3 Removing and installing the engine control unit J623 \(Rapid NH\)", page 295 .](#)



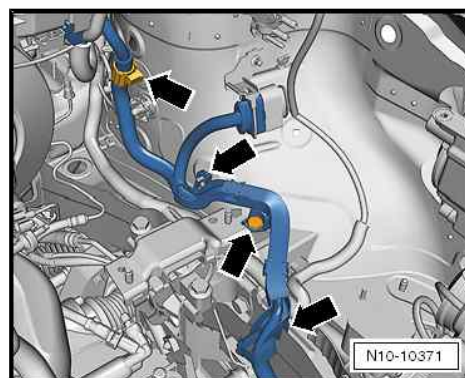
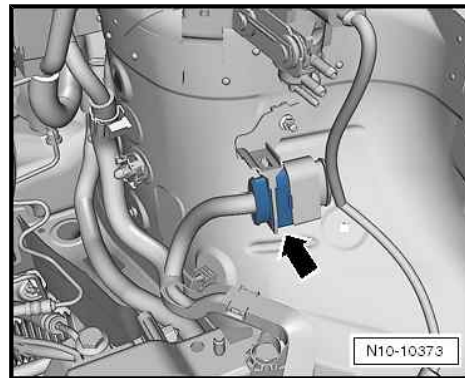


- Disconnect plug -arrow-.

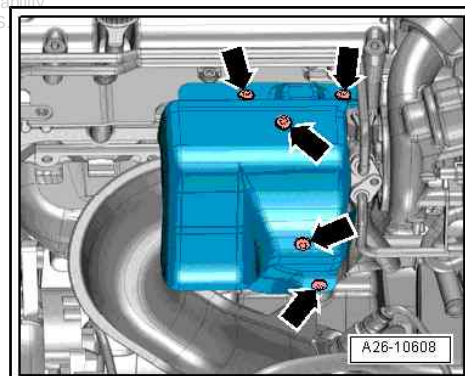
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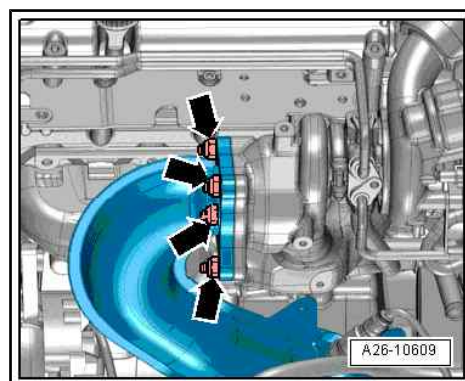
- Expose engine wiring harness -arrows- and place it on the engine.



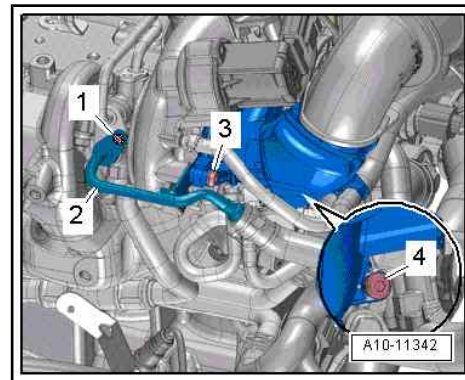
- Unscrew screws -arrows- and remove exhaust gas turbo-charger heat shield.



- Unscrew catalytic converter nuts -arrows-.
- Expose generator wiring harness on the catalytic converter.



- Unscrew screws -1- and -3-, remove coolant pipe -2- and push it to side.



- Take electrical plug connections -3- and -4- out of the holder and disconnect.

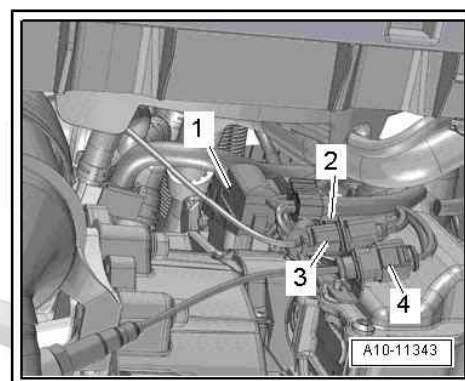
For models with automatic gearbox



Caution

Risk of destruction of gearbox parts.

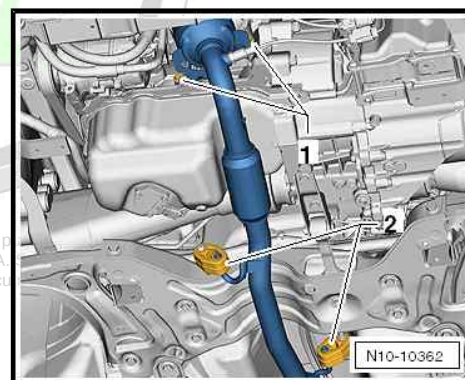
- ◆ **Do not in any circumstances touch the plug contacts in the plugs with the hands. Static discharges may destroy the control unit or the gearbox mechatronics.**
- ◆ **Touch a conductive component with the hands (without gloves) to discharge static electricity.**



- Remove mechatronics plug -1- and take plug connection -2- out of the holder.

Continued for all vehicles

- Unscrew bolts -1-.
- Press pre-exhaust pipe retaining straps -2- downwards off the bolt.



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- Loosen clamping sleeve between front and middle silencer and push clamping sleeve to the rear.
- Remove catalytic converter together with pre-exhaust pipe.

For vehicles with air conditioning

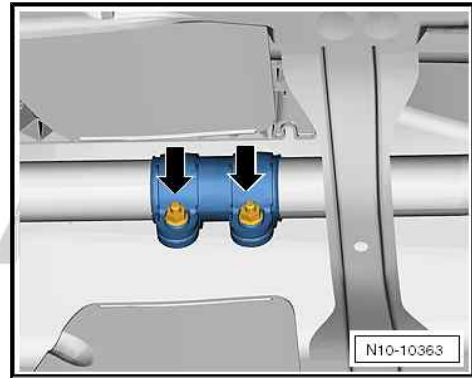
- Remove V-ribbed belt
⇒ ["1.3 Removing and installing V-ribbed belt", page 54](#) .



WARNING

Risk of injury through refrigerant.

- ◆ *Do not open the refrigerant circuit of the air conditioning system.*



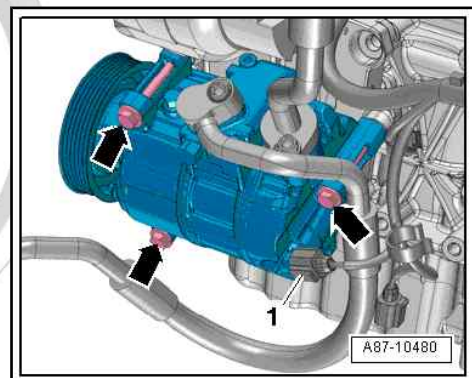
- Disconnect electric plug connection -1- on the control valve for the air conditioning system - N280- compressor.
- Release screws -arrows- for AC compressor.



Caution

Risk of damaging AC compressor, refrigerant lines and hoses.

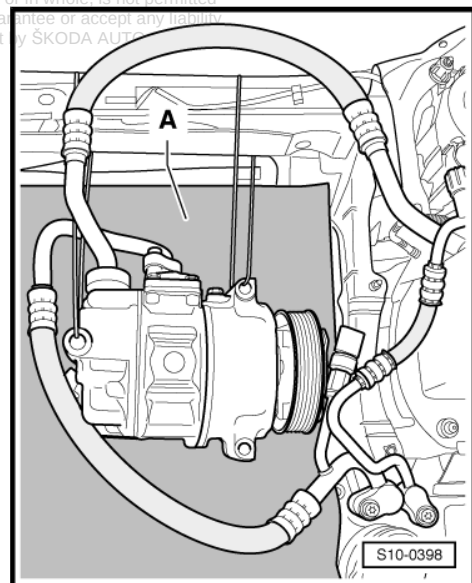
- ◆ *Do not over-tension, buckle or bend refrigerant lines and hoses.*



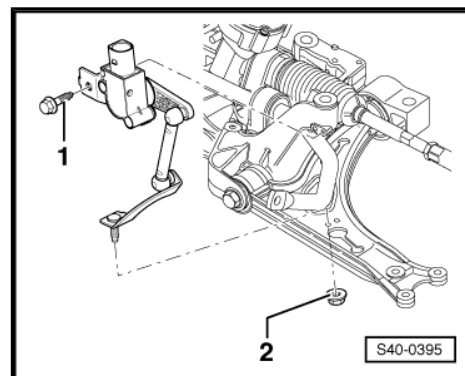
- Secure AC compressor to the lock carrier with connected hoses. Insert a sheet of cardboard -A- when doing so to protect the radiator.

Continued for all vehicles

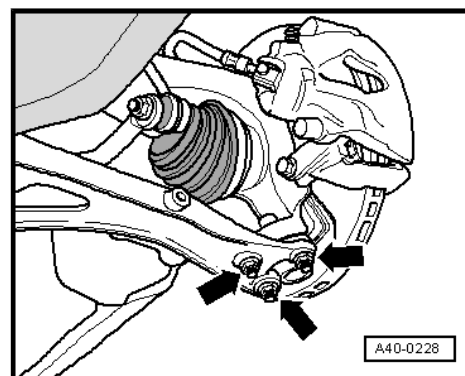
- Remove alternator ⇒ Electrical System; Rep. gr. 27 .
- Remove drive shaft to the right ⇒ Chassis; Rep. gr. 40 .
- Unscrew the left drive shaft from the flange shaft of the gear-box.
- Remove pendulum support
⇒ ["2.4.2 Removing and installing the pendulum support \(Rapid NH\)", page 43](#) .



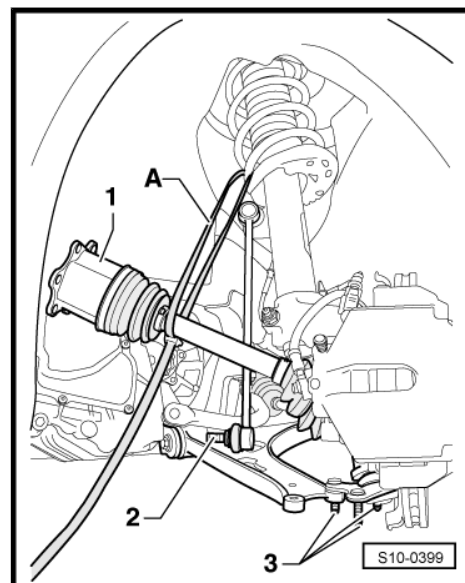
- Unscrew the nut -2- from the track control arm on installed front left vehicle level sensor - G78- .



- Unscrew swivel hub nuts left and right -arrows- and unhook both swivel hubs from the track suspension arms.



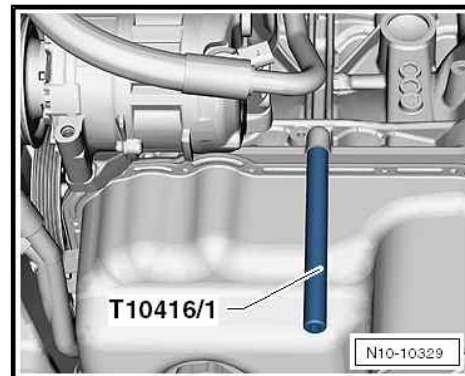
- Unscrew the nut from the left coupling rod -2- and press off the coupling rod from the anti-roll bar.



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- Screw the adapter - T10416/1- into the threaded bore in the cylinder block up to the stop.



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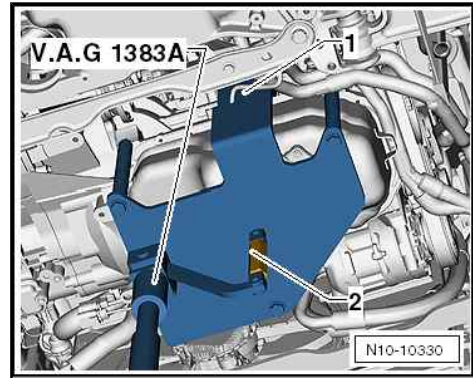


- Position engine mount - T10416- with adapters - T10416/2- and -T10416/3- on the cylinder block.
- First tighten screw -1- until it is hand-tight and until the mount is resting on the block, then tighten all screws of the mount
⇒ [page 28](#) .



Note

Set the correct angle between the bolt on the engine mount - T10416- and the sleeve on the engine and gearbox jack - V.A.G 1388A- using the adjusting nut -2-.



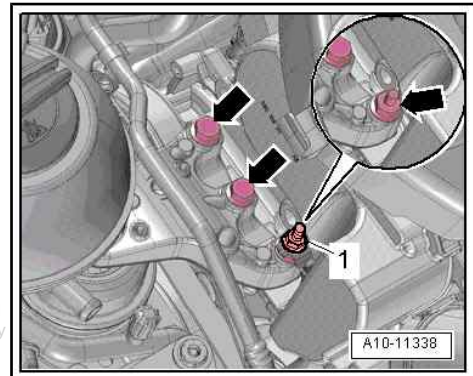
- Connect the engine mount - T10416- to the engine and gear-box jack - V.A.G 1388A- .



Note

Use the double ladder to release the screws for the engine/gear-box assembly bracket.

- Unscrew engine mount release screws -arrows-.

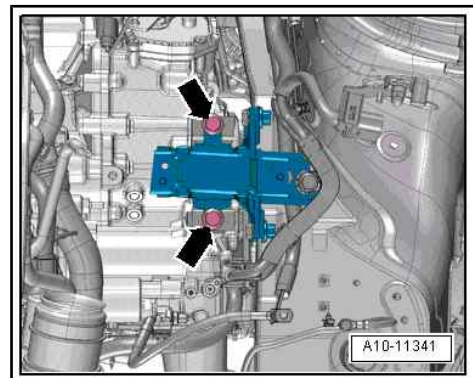


- Unscrew gearbox mount release screws -arrows-.



Note

- ◆ *The engine/gearbox assembly should be lowered with the help of a second mechanic.*
- ◆ *When lowering carefully guide the engine/gearbox assembly, in order to avoid damage.*
- Push engine/gearbox unit as far forward as possible and carefully lower downwards.



Tightening torques

Component	Specified torque
Screws to engine mount - T10416-	20 Nm

1.2 Disconnect engine and gearbox

Special tools and workshop equipment required

- ◆ Additional hook - MP 9-200/10 (10-222A/2)-
- ◆ Workshop crane , e.g. -VAS 6100-
- ◆ Shackle - 10-222A/12-

Work procedure

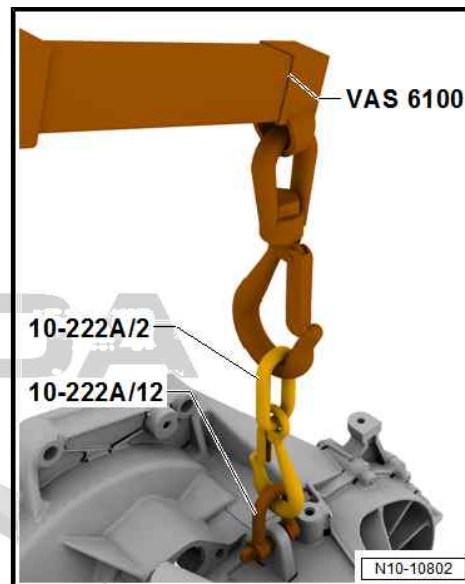
- Engine/gearbox unit removed and attached to engine mount - T10497- .
- Removing starter ⇒ Electrical System; Rep. gr. 27 .
- Install shackle - 10-222A/12- on gearbox.
- Hook additional hook - MP 9-200/10 (10-222A/2)- with shackle - 10-222A/12- onto the workshop crane - VAS 6100- .



Note

Pre-load the workshop crane - VAS 6100- slightly, but do not raise the gearbox.

- Unscrew engine/gearbox connecting screws ⇒ Gearbox; Rep. gr. 34
- Remove the gearbox from the engine.



1.3 Attach engine attached to engine and gearbox mount

Special tools and workshop equipment required

- ◆ Lifting device - MP 9-201 (2024A)-
- ◆ Engine mount - MP 1-202-
- ◆ Assembly stand - MP 9-101- or engine and gearbox mount - VAS 6095-
- ◆ Workshop crane , e.g. -VAS 6100-

Secure the engine with engine mount - MP 1-202- on the assembly stand - MP 9-101- before performing assembly work.

- Guide the engine onto a workbench using the engine and gearbox jack - V.A.G 1383A- .
- Lower the engine with gearbox in such a way that the gearbox is positioned on the support.
- Remove engine/gearbox connecting screws.
- Press gearbox from engine.



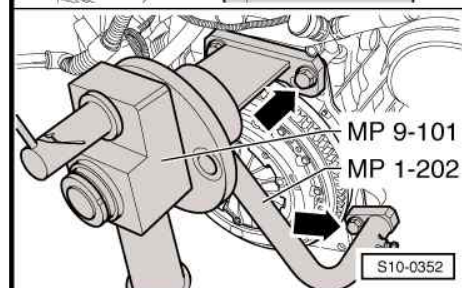
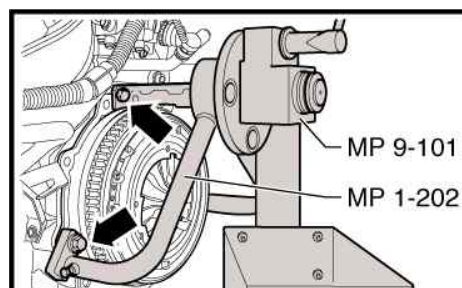
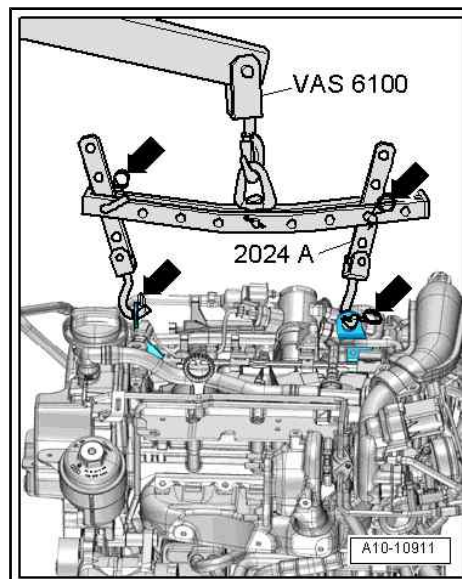
- Insert the lifting device - 2024A- as shown and use the workshop crane to lift the engine with assembled engine mount - T40075A- out of the engine and gearbox jack - V.A.G 1383A- .



WARNING

Use securing pins on the hooks and rig pins -arrows-, in order to avoid injuries and damages to the engine.

- Remove engine mount - T40075A- .
- Screw engine mount - MP 1-202- to engine and secure to the assembly stand - MP 9-101- .



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1.4 Installing the engine

Special tools and workshop equipment required

- ♦ Double ladder , e. g. -VAS 5085-
- ♦ Pliers for spring strap clips , e.g. -VAS 6340-
- ♦ Grease - G 000 100-
- ♦ Cable strap

Precondition

- Engine and gearbox with engine mount - T40075A- , if necessary with engine mount fitted - T10416- onto the engine and gearbox jack - V.A.G 1383A- .

Work procedure

The further assembly is carried out in the reverse order, while paying attention to the following:



Caution

When undertaking all assembly work, particularly in the engine compartment due to its cramped construction, please observe the following:

- ◆ *Route all the various lines (e.g. for fuel, hydraulics, activated charcoal filter system, coolant and refrigerant, brake fluid and vacuum) and electrical wiring in their original positions.*
- ◆ *In order to avoid damage to the cables, ensure that there is adequate free access to all moving or hot components.*



Note

- ◆ *Replace screws which have been tightened firmly to a torquing angle.*
- ◆ *Replace self-locking nuts, gasket rings, gaskets and O-rings.*
- ◆ *Secure all hose connection ends with spring-type clips that comply with the series design ⇒ ETKA - Electronic Catalogue of Original Parts .*
- ◆ *All cable straps should be fastened again in the same place when installing.*

Observe all safety measures and notes for assembly work on the fuel system, on the injection and ignition system and the charge air system as well as rules for cleanliness

⇒ ["2 Safety instructions", page 3](#) .

- Check whether the dowel sleeves for centering the engine/gearbox are present in the cylinder block; insert if necessary.
- Installing intermediate plate
⇒ [Fig. "Installing intermediate plate", page 64](#) .

For vehicles with manual gearbox

- Clean the serration of the drive shaft and if the clutch disc has been used clean the hub serration, remove corrosion and only apply a very thin layer of grease - G 000 100- to the serration of the drive shaft. Subsequently move the clutch disc up and down on the drive shaft until the hub fits smoothly on the shaft. Always remove excess grease.
- Check the centering of the clutch disc ⇒ Gearbox; Rep. gr. 30 .
- Check clutch release bearing for wear and renew if necessary.
- Checking and installing clutch and clutch control.
- Lightly lubricate spline of input shaft with grease - G 000 100- .

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For models with automatic gearbox

- Replace the needle bearing -arrow- in the crankshaft
⇒ [“3.2 Removing and installing the crankshaft needle bearing”, page 74](#) .

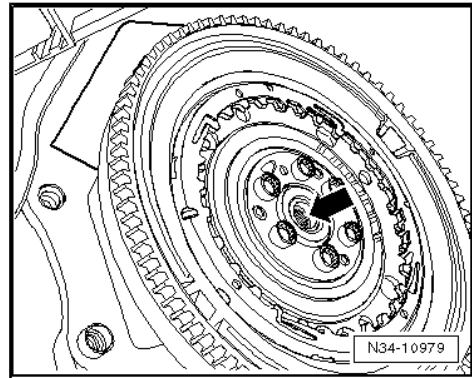
Continued for all vehicles

- Screw on gearbox to engine ⇒ Gearbox; Rep. gr. 34 .



Note

- ◆ *When installing the engine/gearbox assembly, ensure clearance to the assembly carrier, AC compressor as well as to the radiator fans.*
- ◆ *Screw in new screws for securing the engine/gearbox unit.*
- Install assembly bracket and pendulum support
⇒ [“2 Assembly bracket”, page 34](#) .



For vehicles Octavia II, Superb II, Yeti



Note

When adjusting the engine/gearbox assembly bracket do not use the support bracket - MP 9-200 (10-222A)- to support the unit.

- Adjust the assembly bracket
⇒ [“2.6 Adjusting the unit mounting”, page 45](#) .

Continued for all vehicles

- Install drive shafts ⇒ Chassis; Rep. gr. 40 .
- Install AC compressor
⇒ [“1.1 Assembly overview - poly V-belt drive”, page 49](#) .
- Install the V-ribbed belt
⇒ [“1.3 Removing and installing V-ribbed belt”, page 54](#) .

For vehicles with manual gearbox

- Install slave cylinder ⇒ Gearbox; Rep. gr. 30 .
- Attach shift mechanism and adjust if necessary ⇒ Gearbox; Rep. gr. 34 .

For models with automatic gearbox

- Connect the selector lever control cable at the gearbox ⇒ Gearbox; Rep. gr. 34 .

Continued for all vehicles

- Install the engine wiring harness and connect to the engine control unit:
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- ◆ Octavia II
⇒ [“6.1.1 Removing and installing engine control unit J623 \(Octavia II\)”, page 292](#)
- ◆ Superb II and Yeti
⇒ [“6.1.2 Removing and installing engine control unit J623 \(Superb II, Yeti\)”, page 293](#)
- ◆ Rapid NH
⇒ [“6.1.3 Removing and installing the engine control unit J623 \(Rapid NH\)”, page 295](#)
- Install exhaust system
⇒ [“1 Exhaust pipe/silencer”, page 302](#) .

- Install the battery and pay attention to the necessary work after re-connecting the battery ⇒ Electrical System; Rep. gr. 27 .

- Inspecting engine oil level:

◆ ⇒ Maintenance ; Booklet Octavia II .

◆ ⇒ Maintenance ; Booklet Superb II .

◆ ⇒ Maintenance ; Booklet Yeti .

◆ ⇒ Maintenance ; Booklet Rapid NH .

- Top up and bleed cooling system
⇒ [“1.3 Draining and filling coolant”, page 155](#) .

- Interrogate all event memories and delete all event entries which are caused by removing and installing the engine ⇒ Vehicle diagnostic tester.

After deleting the event memory of the engine control unit the readiness code must be re-generated.

- Perform a test drive.
- Then perform a vehicle system test and if necessary eliminate the resulting faults.

Tightening torques



Note

- ◆ *Tightening torques apply only for lightly greased, oiled, phosphatized or blackened nuts and screws.*
- ◆ *Other lubricants such as engine and gearbox oil are allowed, but no lubricants containing graphite.*
- ◆ *Do not use degreased parts.*

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Component	Specified torque	
Screws or nuts	M6	9 Nm
	M7	13 Nm
	M8	20 Nm
	M10	40 Nm
	M12	70 Nm
deviations:		
Engine/gearbox connecting screws ⇒ Gearbox; Rep. gr. 34		
Screws for assembly bracket:		
◆ ⇒ “2.1.1 Summary of components - assembly bracket (Octavia II, Superb II and Yeti)”, page 34		
◆ ⇒ “2.1.2 Summary of components - assembly bracket (Rapid NH)”, page 36		

2 Assembly bracket

⇒ [“2.1 Assembly overview - assembly mountings”, page 34](#)

⇒ [“2.2 Removing and installing engine mount”, page 37](#)

⇒ [“2.3 Removing and installing gearbox mount”, page 40](#)

⇒ [“2.4 Removing and installing pendulum support”, page 43](#)

⇒ [“2.5 Support the engine in its installed position”, page 44](#)

⇒ [“2.6 Adjusting the unit mounting”, page 45](#)

⇒ [“2.7 Check assembly bracket setting”, page 47](#)

2.1 Assembly overview - assembly mountings

⇒ [“2.1.1 Summary of components - assembly bracket \(Octavia II, Superb II and Yeti\)”, page 34](#)

⇒ [“2.1.2 Summary of components - assembly bracket \(Rapid NH\)”, page 36](#)

2.1.1 Summary of components - assembly bracket (Octavia II, Superb II and Yeti)

1 - Gearbox support bracket

2 - Screw

- ☐ Tightening torque ⇒
Gearbox; Rep. gr. 34

3 - Engine mounting

- ☐ removing and installing
⇒ [“2.2.1 Removing and installing engine mount \(Octavia II, Superb II and Yeti\)”, page 37](#)

4 - Screw

- ☐ Replace after disassembly
- ☐ 40 Nm + 90°

5 - Bracket for activated charcoal filter

6 - Screw

- ☐ 9 Nm

7 - Nut

- ☐ 9 Nm

8 - Screw

- ☐ Replace after disassembly
- ☐ 20 Nm + 90°

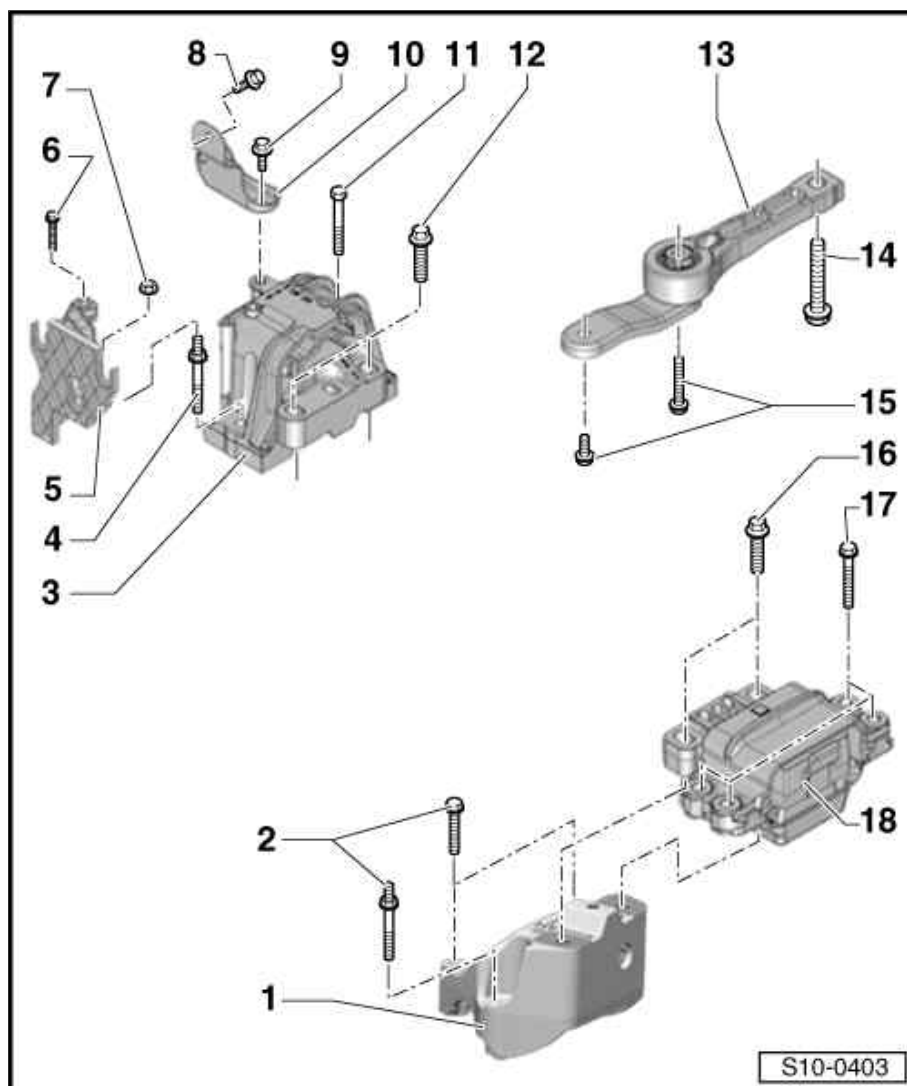
9 - Screw

- ☐ Replace after disassembly
- ☐ 20 Nm + 90°

10 - Connecting part

11 - Screw

- ☐ Replace after disassembly



- ☐ 40 Nm + 90°

12 - Screw

- ☐ Replace after disassembly
- ☐ 60 Nm + 90°

13 - Pendulum support

- ☐ removing and installing
⇒ [“2.4.1 Removing and installing pendulum support \(Octavia II, Superb II, Yeti\)”, page 43](#)

14 - Screw

- ☐ Replace after disassembly
- ☐ 100 Nm + 90°

15 - Screw

- ☐ Replace after disassembly
- ☐ 50 Nm + 90°

16 - Screw

- ☐ Replace after disassembly
- ☐ 60 Nm + 90°

17 - Screw

- ☐ Replace after disassembly
- ☐ 40 Nm + 90°

18 - Gearbox mount

- ☐ removing and installing
⇒ [“2.3.1 Removing and installing gearbox \(Octavia II, Superb II and Yeti\)”, page 40](#)

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2.1.2 Summary of components - assembly bracket (Rapid NH)

1 - Screw

- ☐ Replace after disassembly
- ☐ 50 Nm + 90°

2 - Engine mounting

- ☐ removing and installing
⇒ [“2.2.2 Removing and installing the engine mount \(Rapid NH\)”, page 39](#)

3 - Screw

- ☐ Replace after disassembly
- ☐ 20 Nm + 90°

4 - Screw

- ☐ Replace after disassembly
- ☐ Screw with threaded pin for earth strap, tightening torque of the earth connection
⇒ [Fig. “Earth cable on engine bracket”](#), page 37
- ☐ 30 Nm + 90°

5 - Screw

- ☐ Replace after disassembly
- ☐ 30 Nm + 90°

6 - Pendulum support

- ☐ removing and installing
⇒ [“2.4.2 Removing and installing the pendulum support \(Rapid NH\)”, page 43](#)

7 - Screw

- ☐ Replace after disassembly
- ☐ 40 Nm + 90°

8 - Screw

- ☐ Replace after disassembly
- ☐ 30 Nm + 90°

9 - Screw

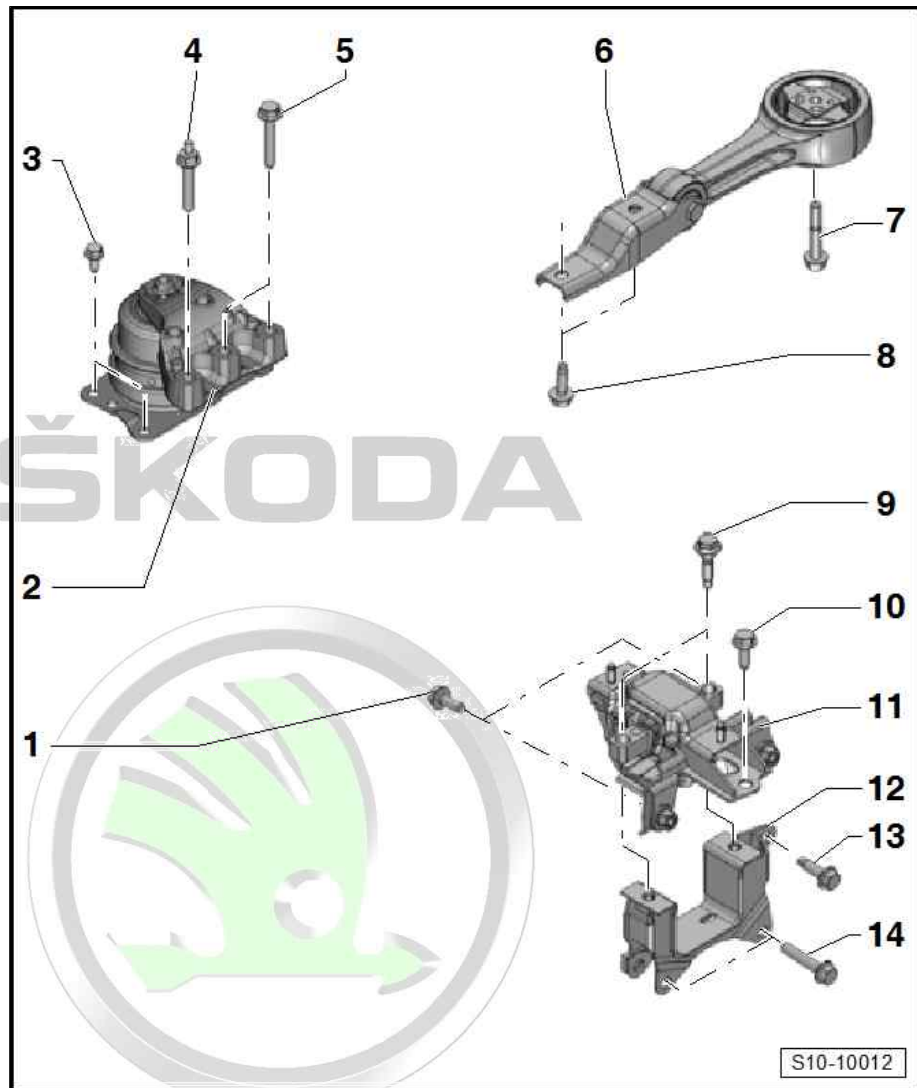
- ☐ Replace after disassembly
- ☐ 40 Nm + 90°

10 - Screw

- ☐ Replace after disassembly
- ☐ 50 Nm + 90°

11 - Gearbox mount

- ☐ removing and installing ⇒ [“2.3.2 Removing and installing the gearbox mount \(Rapid NH\)”, page 42](#)



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12 - Gearbox console

- ☐ Observe part number ⇒ ETKA - Electronic Catalogue of Original Parts

13 - Screw

- ☐ Replace after disassembly
- ☐ only with automatic gearbox (DQ 200)
- ☐ 40 Nm + 90°

14 - Screw

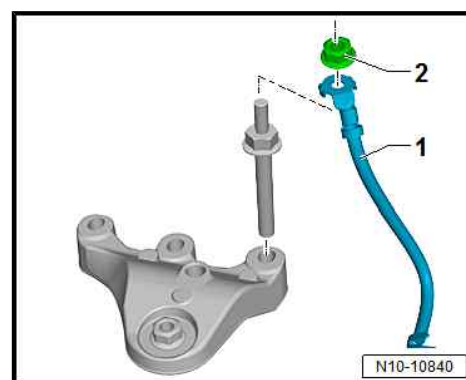
- ☐ Replace after disassembly
- ☐ 40 Nm + 90°

Earth cable on engine bracket

Tightening torques

Component	Specified torque
Nuts -2-	20 Nm

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2.2 Removing and installing engine mount

⇒ [“2.2.1 Removing and installing engine mount \(Octavia II, Superb II and Yeti\)”, page 37](#)

⇒ [“2.2.2 Removing and installing the engine mount \(Rapid NH\)”, page 39](#)

2.2.1 Removing and installing engine mount (Octavia II, Superb II and Yeti)

Special tools and workshop equipment required

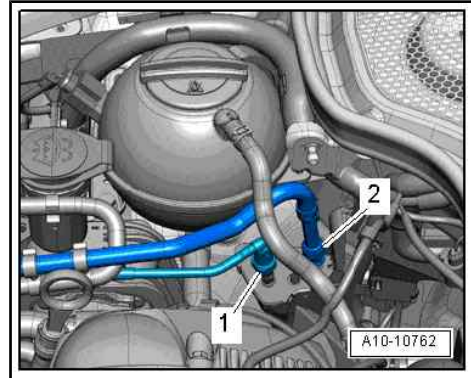
- ◆ Support bracket - T30099-
- ◆ Surface - T30099/1-
- ◆ Hook for MP 9-200, T30099 - MP 9-200/10 (10-222A/10)-
- ◆ Adapter - MP 9-200/18 (10-222A/18)-
- ◆ Strut - 10-222A/31-3-
- ◆ Connecting stud - T40091/3-

Removing

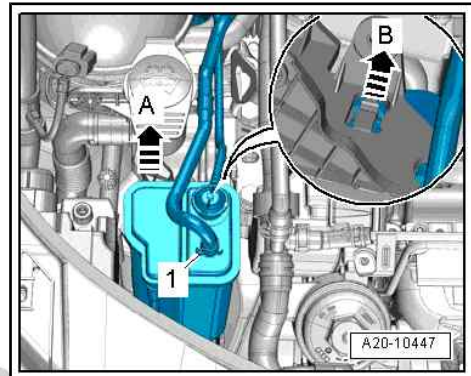
- Remove the cooling water tank cover ⇒ Body Work; Rep. gr. 50 .



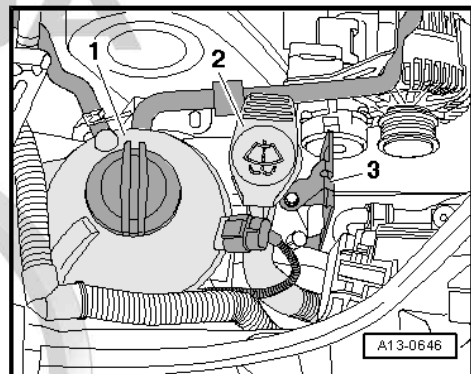
- Disconnect the hose coupling on the line to the activated charcoal filter -1- ➔ ["3.1 Separating quick couplings", page 207](#) .



- Detach the bleeder hose -1- to intake manifold at the activated charcoal filter.
- Unlock activated charcoal filter -arrow B- and remove the activated charcoal filter upwards -arrow A-.



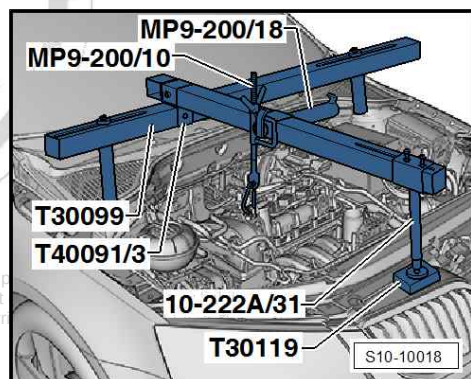
- Unscrew bracket -3- for activated charcoal filter.
- Unscrew screw on windshield washer fluid reservoir filler neck -2-.
- Remove plug from the coolant shortage indicator switch - F66- at the coolant expansion tank -1- and expose electrical wiring loom.
- Unscrew coolant expansion tank screws -1-; place coolant expansion tank with connected hoses on the engine and attach if necessary.
- Remove caps of screwed connections for front suspension strut domes.
- Connect support bracket - T30099- as shown in the illustration.



Note

Instead of base - T30119- use base - T30099/1- .

- Attach snap hook to the engine suspension eye, right.
- Slightly pre-tension engine/gearbox unit with the spindle, do not raise.



- Release screws -1- to -6- and remove engine mounting.

Install

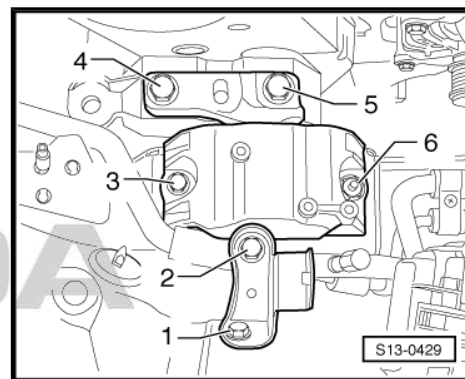
Installation is performed in a similar way in the reverse order. Pay attention to the following points:



Caution

There is a risk of damaging the thread by positioning the bolts obliquely.

Do not remove support bracket - T30099- until the bolts securing the assembly mounting have been tightened to specified torque.



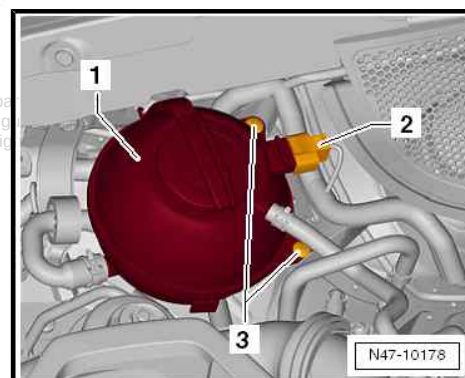
- Check assembly bracket setting
⇒ [“2.7 Check assembly bracket setting”, page 47](#).

Tightening torques

- ◆ ⇒ [“2.1.1 Summary of components - assembly bracket \(Octavia II, Superb II and Yeti\)”, page 34](#)
- ◆ ⇒ [“3.1.1 Summary of components - radiator/radiator fan \(Octavia II, Superb II and Yeti\)”, page 165](#)

2.2.2 Removing and installing the engine mount (Rapid NH)

- Disconnect plug connection -2-.
- Unscrew screws -3- and place coolant expansion tank -1- to one side.
- Suspend engine into the installation position
⇒ [“2.5.1 Support the engine in its installed position \(Octavia II, Yeti and Rapid NH\)”, page 44](#).



- Unscrew nuts -3- and remove earth cable.



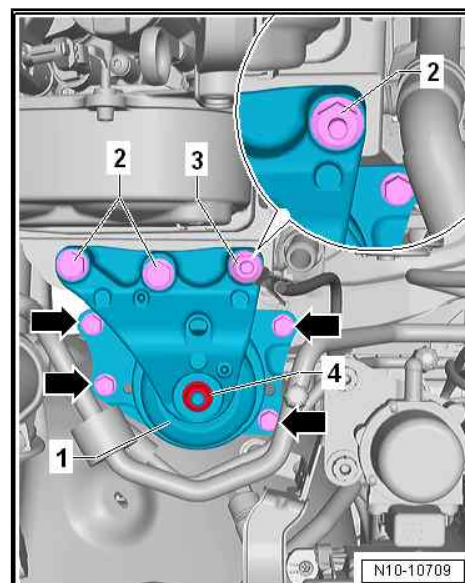
Caution

The securing nut -4- must not be loosened.

- Unscrew bolts -2-.
- Screw out screws -arrows- and remove engine mount.

Install

Installation is performed in a similar way in the reverse order. Pay attention to the following points:





- Position assembly bracket to longitudinal beam



Note

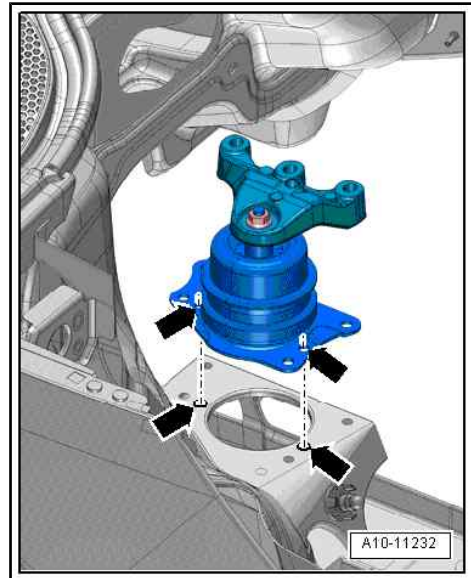
The locking positions -arrows- must be on an axle.



Caution

There is a risk of damaging the thread by positioning the bolts obliquely.

Do not remove support bracket - T30099- until the bolts securing the assembly mounting have been tightened to specified torque.



Tightening torques

- ◆ ⇒ [“2.1.2 Summary of components - assembly bracket \(Rapid NH\)”, page 36](#)
- ◆ ⇒ [“3.1.2 Summary of components - radiator/radiator fan \(Rapid NH\)”, page 167](#)

2.3 Removing and installing gearbox mount

⇒ [“2.3.1 Removing and installing gearbox \(Octavia II, Superb II and Yeti\)”, page 40](#)

⇒ [“2.3.2 Removing and installing the gearbox mount \(Rapid NH\)”, page 42](#)

2.3.1 Removing and installing gearbox (Octavia II, Superb II and Yeti)

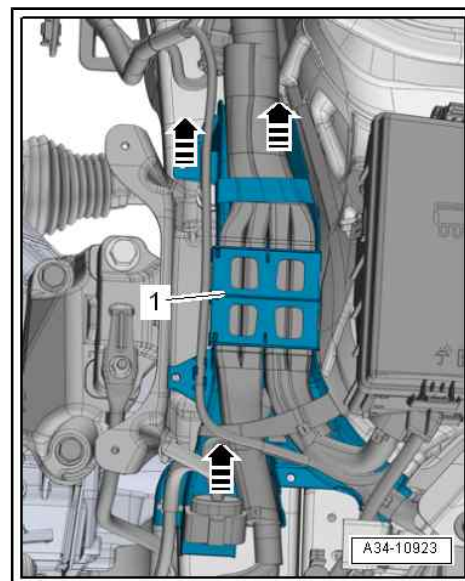
Special tools and workshop equipment required

- ◆ Support bracket - T30099-
- ◆ Adapter - T40091/3-
- ◆ Hook for MP 9-200, T30099 - MP 9-200/10 (10-222A/10)-
- ◆ Adapter - MP 9-200/18 (10-222A/18)-
- ◆ Strut - 10-222A/31-
- ◆ Surface - T30119-

Removing

- Remove the cooling water tank cover ⇒ Body Work; Rep. gr. 50 .
- Remove air filter housing
⇒ [“3.2.1 Removing and installing air filter housing \(Octavia II, Superb II, Yeti\)”, page 277](#) .

- Remove the battery with the battery tray ⇒ Electrical System; Rep. gr. 27 .
- Unscrew screw -1-, unclip upwards -arrows- and push slightly to the side.
- Remove caps of screwed connections for front suspension strut domes.
- Suspend engine into the installation position:
- ◆ ⇒ [“2.5.1 Support the engine in its installed position \(Octavia II, Yeti and Rapid NH\)”](#), page 44
- ◆ ⇒ [“2.5.2 Support the engine in installation position \(Superb II\)”](#), page 44



- Release screws -arrows- and remove gearbox mount -1-.

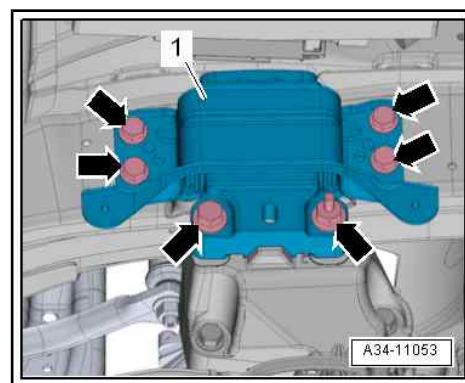
Install

Installation is performed in a similar way in the reverse order. Pay attention to the following points:



Note

Replace screws which have been tightened firmly to a torquing angle.



Caution

There is a risk of damaging the thread in the gearbox support bracket by positioning the bolts obliquely.

- ◆ ***Before screwing in the screws -arrows- the gearbox support bracket and supporting arm of the gearbox mount must be absolutely parallel to each other. If necessary, push up gearbox at the rear using a hydraulic trolley jack.***
- ◆ ***Do not remove support bracket - T30099- until the bolts securing the assembly mounting have been tightened to specified torque.***

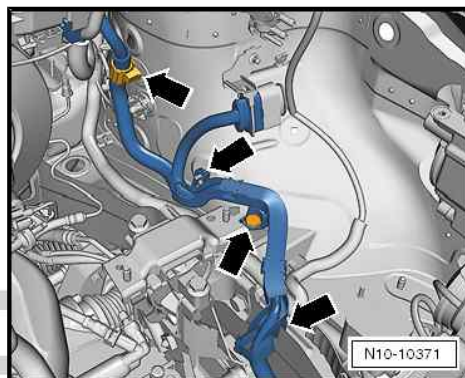
- Lift gearbox with the support bracket spindle until the gearbox support bracket is touching the supporting arm of the gearbox mount.
- Check assembly bracket setting
⇒ [“2.7 Check assembly bracket setting”](#), page 47 .
- Remove support bracket - T30099- .

Tightening torques

- ◆ ⇒ [“2.1.1 Summary of components - assembly bracket \(Octavia II, Superb II and Yeti\)”](#), page 34
- ◆ ⇒ [“3.1.1 Summary of components - air filter housing \(Octavia II, Superb II and Yeti\)”](#), page 276

2.3.2 Removing and installing the gearbox mount (Rapid NH)

- Remove air filter housing
⇒ [“3.2.2 Removing and installing the air filter housing \(Rapid NH\)”, page 278](#) .
- Remove battery and battery tray ⇒ Electrical System; Rep. gr. 27 .
- Carefully unclip the electric wiring harness to the attachment points -arrows-.
- Suspend engine into the installation position
⇒ [“2.5.1 Support the engine in its installed position \(Octavia II, Yeti and Rapid NH\)”, page 44](#) .



- Unscrew the fixing screws -arrows- from the gearbox mount.

Install

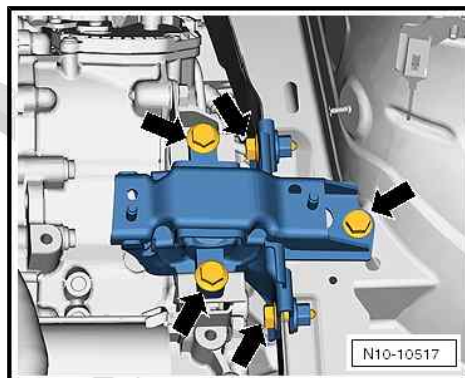
Installation is performed in a similar way in the reverse order. Pay attention to the following points:



Caution

There is a risk of damaging the thread in the gearbox support bracket by positioning the bolts obliquely.

- ◆ *Before screwing in the screws -arrows- the gearbox support bracket and supporting arm of the gearbox mount must be absolutely parallel to each other. If necessary, push up gearbox at the rear using a hydraulic trolley jack.*
- ◆ *Do not remove support bracket - T30099- until the bolts securing the assembly mounting have been tightened to specified torque.*



Tightening torques

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- ◆ ⇒ [“2.1.2 Summary of components - assembly bracket \(Rapid NH\)”, page 36](#)
- ◆ ⇒ [“3.1.2 Summary of components - air filter housing \(Rapid NH\)”, page 277](#)

2.4 Removing and installing pendulum support

⇒ ["2.4.1 Removing and installing pendulum support \(Octavia II, Superb II, Yeti\)", page 43](#)

⇒ ["2.4.2 Removing and installing the pendulum support \(Rapid NH\)", page 43](#)

2.4.1 Removing and installing pendulum support (Octavia II, Superb II, Yeti)

Removing

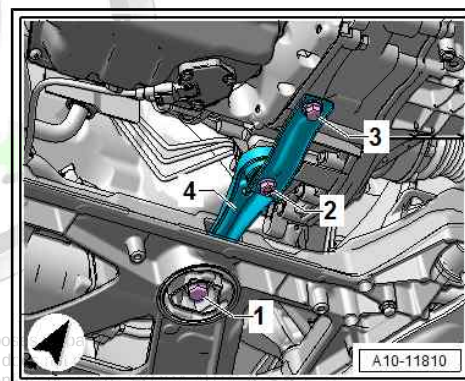
- Remove the sound dampening system ⇒ Body Work; Rep. gr. 50 .
- Undo screws -1-, -2-, -3- and remove the pendulum support.
- Undo pendulum support from the assembly carrier.

Install

Installation is carried out in the reverse order.

Tightening torques

- ◆ ⇒ ["2.1.1 Summary of components - assembly bracket \(Octavia II, Superb II and Yeti\)", page 34](#)
- ◆ Noise insulation ⇒ Body Work- Assembly; Rep. gr. 50



2.4.2 Removing and installing the pendulum support (Rapid NH)

Removing

- Remove the sound dampening system ⇒ Body Work; Rep. gr. 66 .
- Unscrew screws -arrows- of pendulum support.



Caution

Bolt -1- must not be loosened.

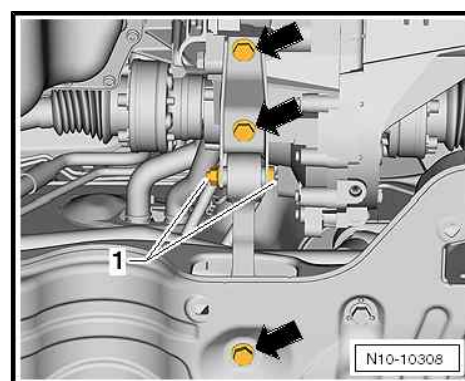
- Undo pendulum support from the assembly carrier.

Install

Installation is carried out in the reverse order.

Tightening torques

- ◆ ⇒ ["2.1.2 Summary of components - assembly bracket \(Rapid NH\)", page 36](#)
- ◆ Noise insulation ⇒ Body Work- Assembly; Rep. gr. 50



2.5 Support the engine in its installed position

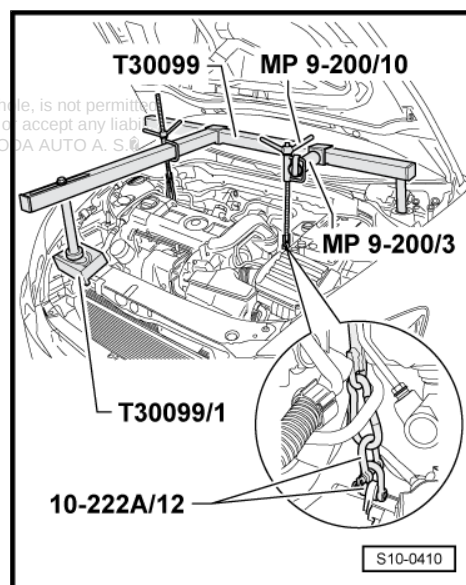
⇒ "2.5.1 Support the engine in its installed position (Octavia II, Yeti and Rapid NH)", page 44

⇒ "2.5.2 Support the engine in installation position (Superb II)", page 44

2.5.1 Support the engine in its installed position (Octavia II, Yeti and Rapid NH)

Special tools and workshop equipment required

- ◆ Support bracket - T30099-
- ◆ Surface - T30099/1-
- ◆ Adapter - MP 9-200/3 (10-222A/3)-
- ◆ Lifting eye - 10-222A/12-
- ◆ Hook - MP 9-200/10-
- ◆ Snap hook
- Remove the cooling water tank cover ⇒ Body Work; Rep. gr. 66 .
- Install adapter - MP 9-200/3 - with hooks - MP 9-200/10 - on the support bracket - T30099- as shown in the figure.
- Position the support bracket - T30099- with base - T30099/1- and secure the engine in the installation position with the shackle - 10-222A/12 - .
- Uniformly pre-tension the engine/gearbox assembly at both spindles, but do not raise.



2.5.2 Support the engine in installation position (Superb II)

Special tools and workshop equipment required

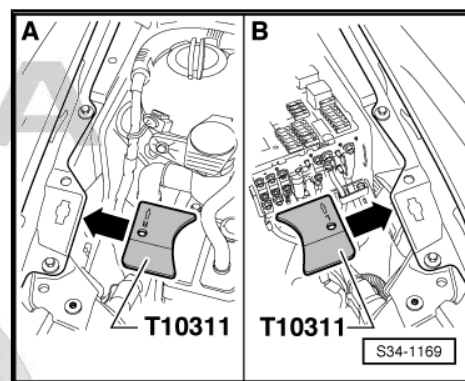
- ◆ Lifting device - MP 9-200 (10-222A)-
- ◆ Hook for MP 9-200, T30099 - MP 9-200/10 (10-222A/10) -
- ◆ Wing plates - T10311-
- Remove the front stop buffers for the front flap from both upper edges of the wings.

- Insert the wing plate - T10311- on the right vehicle side -A- in -the direction of the arrow- up to the stop. When doing this, the -arrow R- on the wing plate - T10311- points to the rear.
- Also insert the wing plate - T10311- on the left vehicle side -B- in -the direction of the arrow- up to the stop. When doing this, the -arrow L- on the wing plate - T10311- points to the rear.

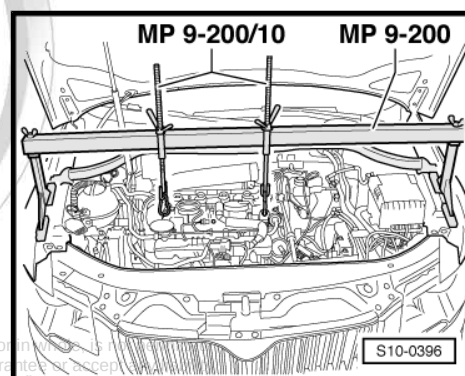


Note

The wing plates - T10311- ensure that the wings do not get damaged through the weight of the engine/gearbox unit.



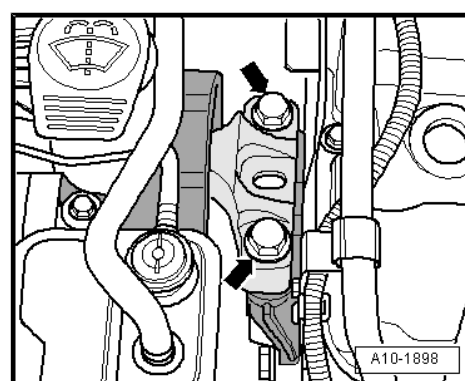
- Position support bracket - MP 9-200- and support the engine/ gearbox unit in the installation position using two hooks - MP 9-200/10 - .
- Uniformly pre-tension the engine/gearbox assembly at both spindles, but do not raise.



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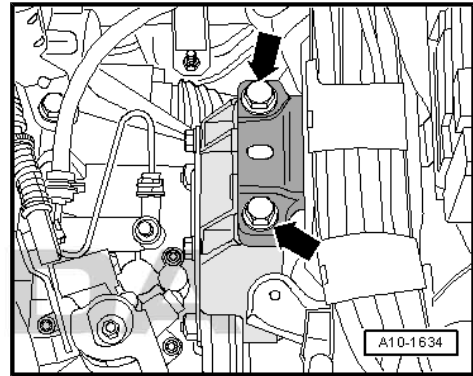
2.6 Adjusting the unit mounting

- Remove battery and battery tray ⇒ Electrical System; Rep. gr. 27 .
- Suspend engine into the installation position:
 - ◆ ⇒ [“2.5.1 Support the engine in its installed position \(Octavia II, Yeti and Rapid NH\)”](#), page 44
 - ◆ ⇒ [“2.5.2 Support the engine in installation position \(Superb II\)”](#), page 44
- Release the screws -arrows- of the assembly bracket at the engine.





- Slightly loosen the screws -arrows- of the assembly bracket at the gearbox (less than 1 revolution).
- Successively replace all the screws of the assembly bracket (as long as it has not already been performed when installing the engine) and insert these loosely.

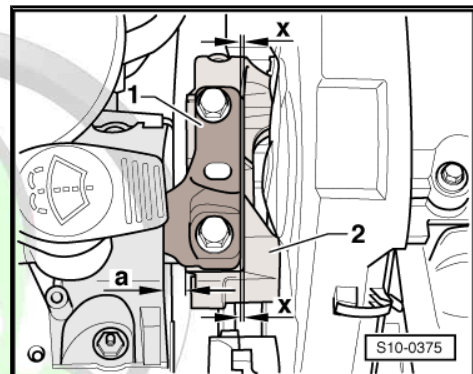


- Move the engine/gearbox assembly with an assembly lever between engine support -2- and supporting arm -1- for engine mount until the following dimensions are set:
 - Between engine mount and engine support, there must be a distance -a- of 10 mm.
 - The cast iron edge on the engine support -2- must be parallel to the supporting arm -1- the dimension -x- must be the same at the front and rear.



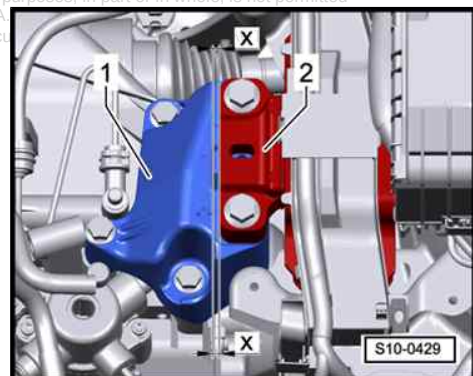
Note

The distance -a- = 10 mm can also be checked e.g. with suitable round bars.



- Tighten the screws for the engine side assembly bracket
⇒ ["2.1.1 Summary of components - assembly bracket \(Octavia II, Superb II and Yeti\)", page 34](#) .
- Make sure that on the gearbox side the edges of the supporting arm -2- and gearbox support -1- are parallel.
 - The dimension -x- must be the same on both mount sides.
- Tighten the screws for the gearbox side assembly bracket
⇒ ["2.1.1 Summary of components - assembly bracket \(Octavia II, Superb II and Yeti\)", page 34](#) .

Further installation occurs in reverse order.



2.7 Check assembly bracket setting

- Check dimensions on the right hanger for engine/gearbox unit:
- Between engine mount and engine support, there must be a distance -a- of 10 mm.
- The cast iron edge on the engine support -2- must be parallel to the supporting arm -1- the dimension -x- must be the same at the front and rear.

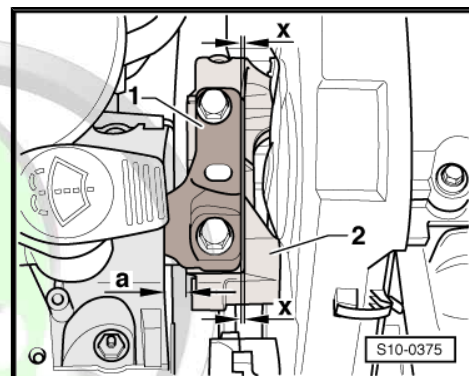


Note

The distance -a- can also be checked e.g. with suitable round bars.

Only if there is an acoustic complaint (engine or gearbox knock on the frame side rail when cornering) and the dimension -a- is not 10 mm:

- Adjust the assembly bracket
⇒ [“2.6 Adjusting the unit mounting”, page 45](#) .



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3 Engine trim panel

⇒ "3.1 Removing and installing engine trim panel", page 48

3.1 Removing and installing engine trim panel

Removing

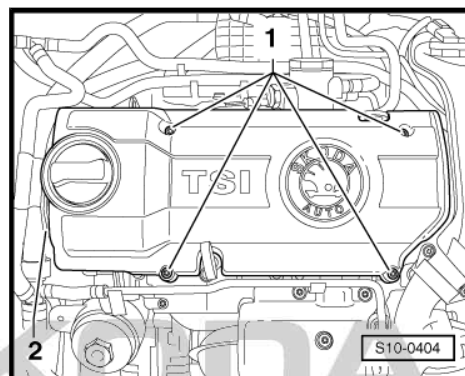
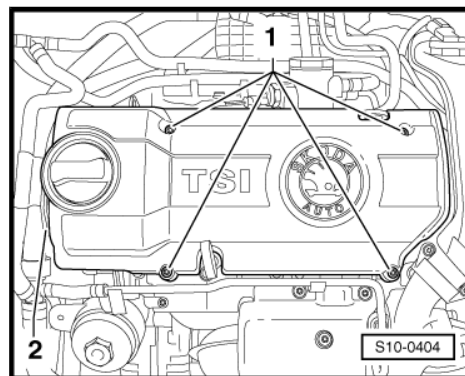
- Screw out the fixing screws -1- of the fixing screws.
- Unhook coolant hoses-2- at the engine cover and pull the engine cover off upwards.

Install

- Place engine cover on the camshaft housing and hook the coolant hoses -2- into the brackets.
- Tighten fixing screws -1-.

Tightening torques

Component	Specified torque
Screw	8 Nm



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13 – Crankshaft group

1 Cylinder block on belt pulley side

⇒ [“1.1 Assembly overview - poly V-belt drive”, page 49](#)

⇒ [“1.2 Assembly overview - cylinder block \(pulley end\)”, page 51](#)

⇒ [“1.3 Removing and installing V-ribbed belt”, page 54](#)

⇒ [“1.4 Removing and installing ribbed belt pulley”, page 55](#)

⇒ [“1.5 Removing and installing bracket for auxiliary units”, page 59](#)

⇒ [“1.6 Replacing crankshaft seal on belt pulley side”, page 60](#)

1.1 Assembly overview - poly V-belt drive

1 - V-ribbed belt

- ☐ mark the direction of rotation with chalk or a felt-tip pen before removing
- ☐ check for wear
- ☐ do not kink
- ☐ do not kink
- ☐ depending on the model of the belt pulley for alternator, the correct length of the V-ribbed belt must be assigned ⇒ ETKA - Electronic Catalogue of Original Parts
- ☐ pay attention to the correct position on the belt pulley when installing it.
- ☐ removing and installing ⇒ [“1.3 Removing and installing V-ribbed belt”, page 54](#)

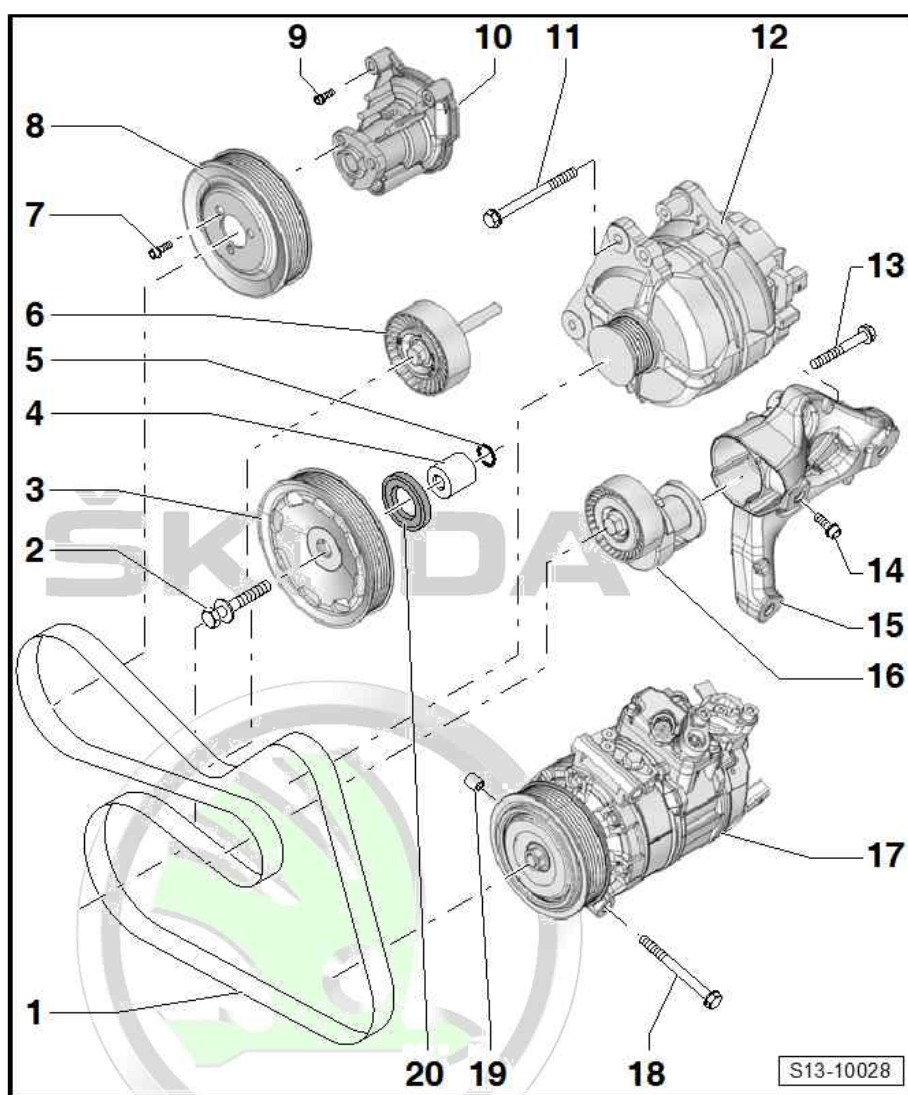
2 - Screw

- ☐ Replace after disassembly
- ☐ to release and tighten use counterholder - T30004 (3415)-



Caution

*There is a risk of destruction of the engine.
So as not to adjust the timing the crankshaft must not be turned while the screws are removed.*



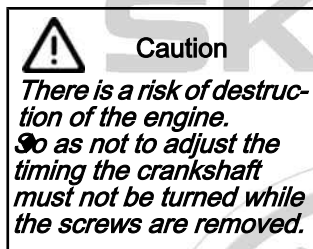
- ☐ The clamping surface of the fixing screw must be free of grease and oil.
- ☐ insert oiled (thread)
- ☐ 150 Nm + 180°

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3 - Vibration damper

- ☐ Clamping surfaces must be free of oil and grease.



- ☐ removing and installing ⇒ ["1.4 Removing and installing ribbed belt pulley", page 55](#)
- ☐ Removing and installing V-ribbed belt ⇒ ["1.3 Removing and installing V-ribbed belt", page 54](#)

4 - Distance sleeve

- ☐ Contact surfaces must be free of oil and grease
- ☐ install with new O-ring -Position 5-

5 - O-ring

- ☐ Replace after disassembly
- ☐ in the distance sleeve -Position 4-

6 - Guide pulley

- ☐ 42 Nm

7 - Screw

- ☐ When loosening and tightening, counterhold with adapted wrench for the water pump and power-assisted steering - MP 1-308 (V.A.G 1590)- ⇒ [page 163](#)
- ☐ 20 Nm

8 - Belt pulley for coolant pump

- ☐ removing and installing ⇒ ["2.5 Removing and installing belt pulley for coolant pump", page 163](#)

9 - Screw

- ☐ Tightening torque ⇒ ["2.1 Assembly overview - coolant pump", page 160](#)

10 - Coolant pump

- ☐ removing and installing ⇒ ["2.4 Removing and installing coolant pump", page 162](#)

11 - Screw

- ☐ Tightening torque ⇒ Electrical system; Rep. gr. 27

12 - AC generator

- ☐ to facilitate positioning, drive the threaded bushings of the screws at the generator slightly backwards
- ☐ removing and installing ⇒ Electrical System; Rep. gr. 27

13 - Screw

- ☐ Replace after disassembly
- ☐ 40 Nm + 90°

14 - Screw

- ☐ 25 Nm

15 - Bracket for auxiliary units

- ☐ for tensioning device and AC compressor
- ☐ removing and installing ⇒ ["1.5 Removing and installing bracket for auxiliary units", page 59](#)

16 - Tensioning pulley

- ☐ for the V-ribbed belt
- ☐ Secure the tensioning element with the locking pin - T10060A-
- ☐ to remove, release screw -Pos. 13-

17 - AC compressor

- ☐ removing and installing ⇒ Heating, Air Conditioning; Rep. gr. 87

18 - Screw

- ☐ Tightening torques ⇒ Heating, Air Conditioning; Rep. gr. 87

19 - Fitting sleeve

20 - Sealing ring

- ☐ for crankshaft in timing case
- ☐ replace after removal ⇒ ["1.6 Replacing crankshaft seal on belt pulley side", page 60](#)

1.2 Assembly overview - cylinder block (pulley end)



Note

- ◆ *Before assembly, oil all bearing and contact surfaces.*
- ◆ *If considerable quantities of metal swarf or abrasion is found when carrying out engine repairs, this can be subject to damage to the crankshaft and conrod bearings. In order to avoid consequential damage, after the repair perform the following tasks:*
 - Carefully clean the oil galleries.
 - Replace oil spray jets.
 - Replace engine oil cooler.



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- Replace oil filter.

1 - Cylinder head with cylinder head cover

- ☐ removing and installing
⇒ [“1.2 Removing and installing the cylinder head”, page 85](#)
- ☐ Do not rework the sealing surface
- ☐ Cylinder head housing with integrated camshaft bearings

2 - Cylinder block

- ☐ Sealing flanges and flywheel
⇒ [“2.1 Assembly overview - cylinder block, gearbox end”, page 62](#)
- ☐ Pistons and conrods
⇒ [“4.1 Assembly overview - piston and con-rod”, page 76](#)
- ☐ inspect cylinder bore
⇒ [Fig. “Inspecting cylinder bore”, page 79](#)

3 - Bracket for auxiliary units

- ☐ for tensioning device and AC compressor
- ☐ removing and installing
⇒ [“1.5 Removing and installing bracket for auxiliary units”, page 59](#)

4 - Cover

5 - Sprocket

- ☐ for oil pump drive and timing chain
- ☐ Clamping surfaces must be free of oil and grease.

6 - Screw

- ☐ Replace after disassembly
- ☐ Tightening torque ⇒ [“3.1 Summary of components - timing chain”, page 105](#)

7 - Sprocket

8 - Chain

- ☐ mark running direction (installed position) before removing

9 - Screw

- ☐ 25 Nm

10 - Carrier bolt for tensioning device

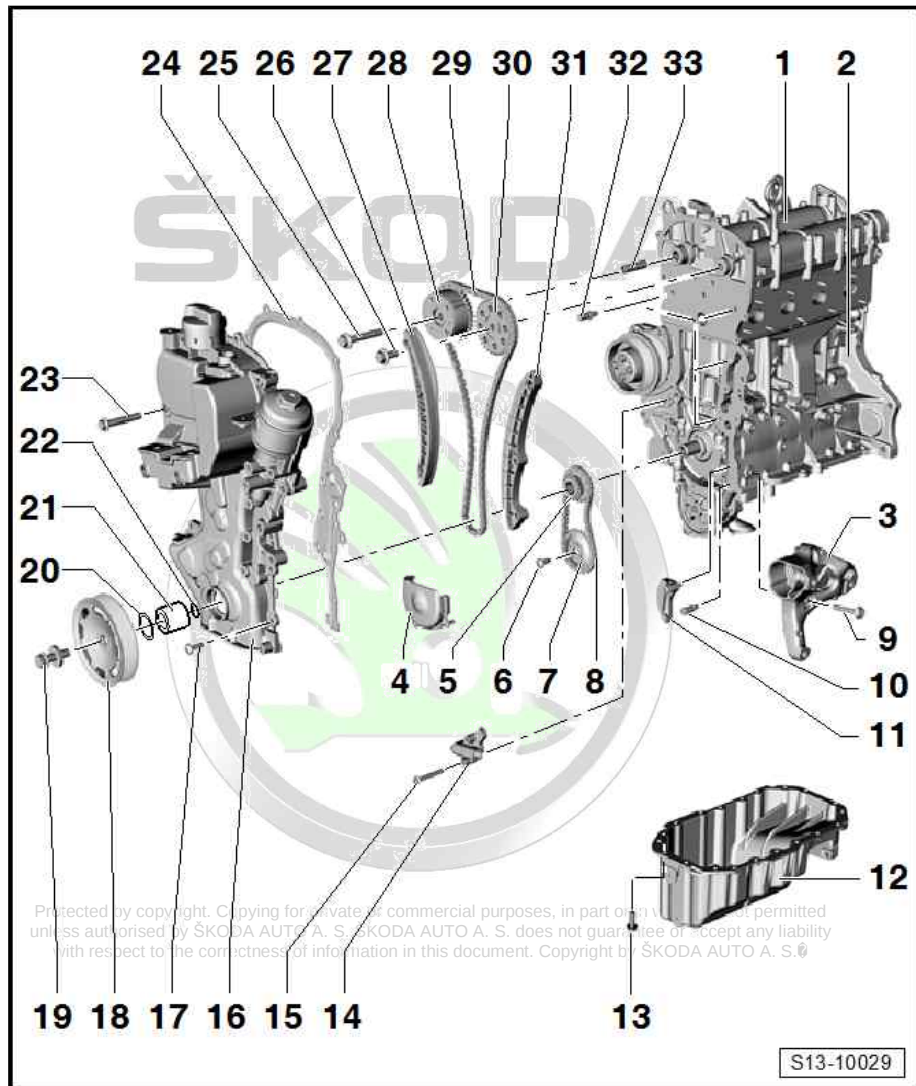
- ☐ Tightening torque ⇒ [“3.1 Summary of components - timing chain”, page 105](#)

11 - Chain tensioner with tensioning rail

- ☐ for oil pump drive

12 - Oil pan

- ☐ removing and installing ⇒ [“1.3 Removing and installing oil pan”, page 140](#)
- ☐ clean sealing surface before installing



- ☐ Install with silicone sealant ➔ ETKA - Electronic Catalogue of Original Parts

13 - Screw

- ☐ Replace after disassembly
- ☐ Tightening torque ➔ ["1.1 Assembly overview - sump/oil pump", page 137](#)

14 - Chain tensioner

15 - Screw

- ☐ Tightening torque ➔ ["3.1 Summary of components - timing chain", page 105](#)

16 - Timing case

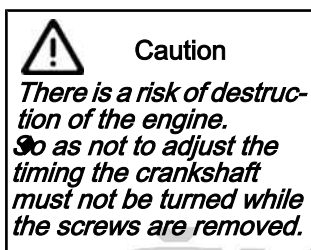
- ☐ removing and installing ➔ ["2.1 Removing and installing the timing case", page 97](#)
- ☐ Install with sealant ➔ ETKA - Electronic Catalogue of Original Parts

17 - Screw

- ☐ Tightening torque ➔ ["3.1 Summary of components - timing chain", page 105](#)

18 - Vibration damper

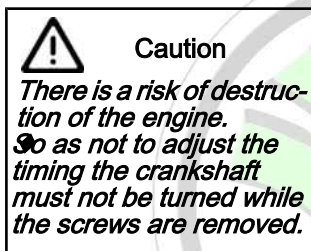
- ☐ Clamping surfaces must be free of oil and grease.



- ☐ removing and installing ➔ ["1.4 Removing and installing ribbed belt pulley", page 55](#)
- ☐ Removing and installing V-ribbed belt ➔ ["1.3 Removing and installing V-ribbed belt", page 54](#)

19 - Fixing screw

- ☐ Replace after disassembly
- ☐ to release and tighten use counterholder - T30004 (3415)-



- ☐ The clamping surface of the fixing screw must be free of grease and oil.
- ☐ insert oiled (thread)
- ☐ slacken and tighten ➔ ["1.4 Removing and installing ribbed belt pulley", page 55](#)
- ☐ Tightening torque ➔ ["1.1 Assembly overview - poly V-belt drive", page 49](#)

20 - Sealing ring

- ☐ for crankshaft in timing case
- ☐ replace after removal ➔ ["1.6 Replacing crankshaft seal on belt pulley side", page 60](#)

21 - Distance sleeve

- ☐ Contact surfaces must be free of oil and grease
- ☐ install with new O-ring -Position 22-

22 - O-ring

- ☐ Replace after disassembly
- ☐ in the distance sleeve -Position 21-

23 - Screw

- ☐ Tightening torque ⇒ [“3.1 Summary of components - timing chain”, page 105](#)

24 - Gasket

25 - Screw

- ☐ Replace after disassembly
- ☐ Tightening torque ⇒ [“3.1 Summary of components - timing chain”, page 105](#)

26 - Screw

- ☐ Tightening torque ⇒ [“3.1 Summary of components - timing chain”, page 105](#)

27 - Tensioning rail

28 - Camshaft adjuster

- ☐ for inlet valves
- ☐ must not be disassembled
- ☐ removing and installing
⇒ [“3.2 Removing and installing timing chain and drive chain for oil pump”, page 108](#)

29 - Timing chain

- ☐ removing and installing
⇒ [“3.2 Removing and installing timing chain and drive chain for oil pump”, page 108](#)
- ☐ Set the timing ⇒ [“3.4 Adjusting valve timing”, page 119](#) .

30 - Sprocket

- ☐ for exhaust camshaft
- ☐ removing and installing
⇒ [“3.2 Removing and installing timing chain and drive chain for oil pump”, page 108](#)

31 - Sliding rail

- ☐ for timing chain

32 - Guide bolt

- ☐ Tightening torque ⇒ [“3.1 Summary of components - timing chain”, page 105](#)

33 - Bearing bush

1.3 Removing and installing V-ribbed belt

Special tools and workshop equipment required

- ◆ Locking pin - T10060A-

Removing

- Remove the sound dampening system ⇒ Body Work; Rep. gr. 50 .



Caution

There is a risk of destruction through reversing the rotation direction of an already used V-ribbed belt.

- ◆ *Mark the direction of rotation with chalk or a felt-tip pen for the re-installation before removing the V-ribbed belt.*

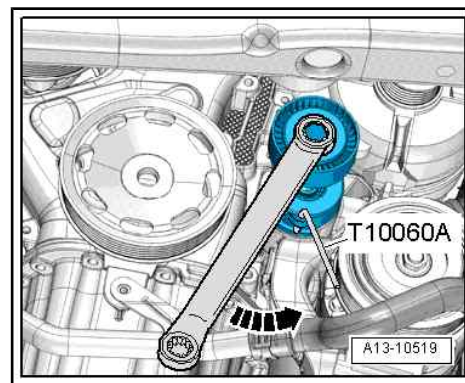
- Swivel out tensioning pulley in -direction of arrow-.
- Lock tensioning pulley with locking pin - T10060A- .
- Remove the V-ribbed belt.

Install



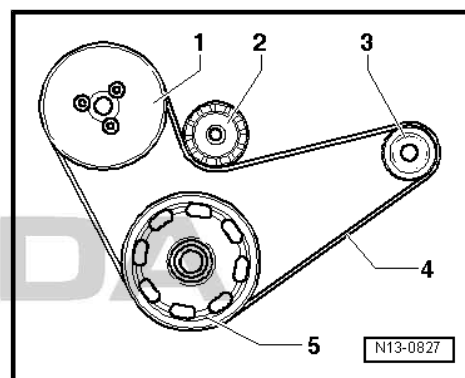
Note

- ◆ *Before fitting the V-ribbed belt make sure that all assemblies (AC generator, AC compressor, coolant pump) are securely mounted.*
- ◆ *Pay attention to the correct position and rotation direction of the V-ribbed belt in the belt pulley when installing it.*
- First lay the V-ribbed belt on the vibration damper. Then shift the belt onto the tensioning roller.



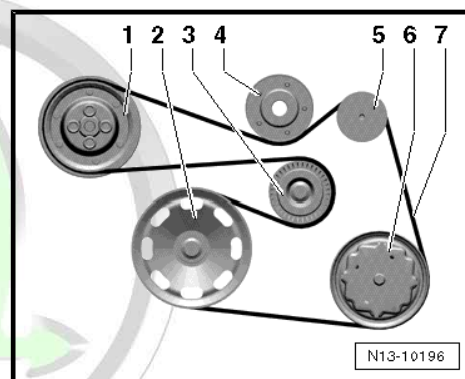
Routing of ribbed V-belt on vehicles without air conditioning

- 1 - Coolant pump
- 2 - Swivel tensioning pulley for V-ribbed belt
- 3 - AC generator
- 4 - V-ribbed belt
- 5 - Crankshaft



Routing of ribbed V-belt on vehicles with air conditioning

- 1 - Coolant pump
- 2 - Crankshaft
- 3 - Swivel tensioning pulley for V-ribbed belt
- 4 - Guide pulley
- 5 - AC generator
- 6 - AC compressor
- 7 - V-ribbed belt



Further assembly is carried out in the reverse order, but note the following:

- Start engine and check ribbed V-belt run.

Tightening torques

- ◆ Noise insulation ⇒ Body Work- Assembly; Rep. gr. 50

1.4 Removing and installing ribbed belt pulley

Special tools and workshop equipment required

- ◆ Counterholder - T30004 (3415)-
- ◆ Bolt - T30004/1 (3415/1)-
- ◆ Fixing screw - T10340-
- ◆ Adapter for dial gauge - T10170- or -T10170A-



- ◆ Dial gauge , e.g. -VAS 6079-

Removing



Note

- ◆ *In order to avoid that the tightening torque of the fixing screw for the vibration damper being altered by slip, the fixing screw - T10340- must be used in addition to the counterholder - T30004- .*
- ◆ *The crankshaft is only locked in direction of rotation of engine using the fixing screw - T10340- .*



Caution

Risk of engine damage!

- ◆ *The fixing screw - T10340- must not be used to slacken the fixing screw for the vibration damper - only for tightening!*
- ◆ *The fixing screw - T10340- must only be screwed in the "TDC" position of the crankshaft.*

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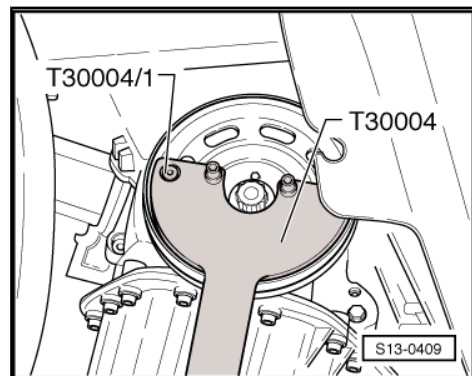
- Remove V-ribbed belt
⇒ **"1.3 Removing and installing V-ribbed belt", page 54 .**
- Remove the sound dampening system ⇒ Body Work; Rep. gr. 50 .
- Loosen fixing screw for vibration damper. To do so, counterhold the vibration damper with counterholder - T30004- with bolt - T30004/1- .
- Unscrew fixing screw and remove vibration damper.



Caution

Risk of engine damage.

- ◆ *In order to avoid that the chain sprocket on the crankshaft slides out of the driver, the crankshaft must not be turned when the V-ribbed belt pulley is released or the screw is loose.*



Install

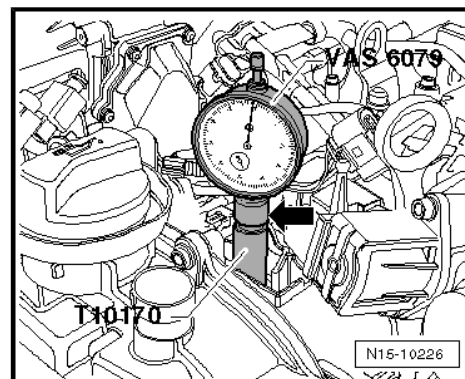
- Tighten new fixing screw for vibration damper until hand-tight.



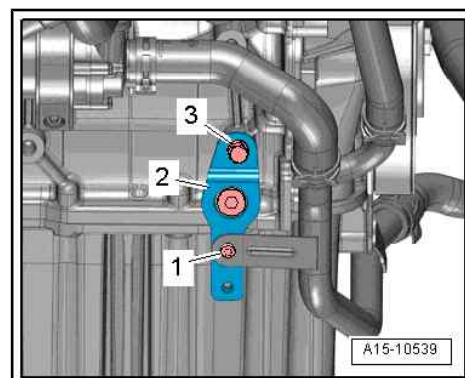
Note

Make sure that the clamping surfaces of the fixing screw, belt pulley and the distance sleeve are free of oil and grease.

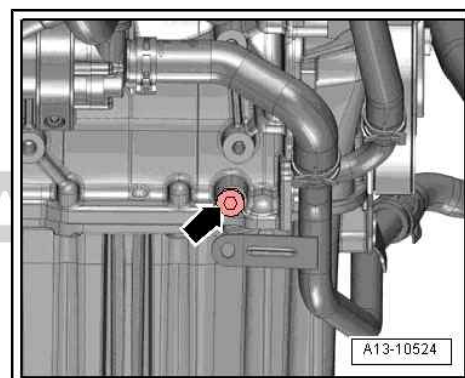
- Rotate the crankshaft in direction of rotation of engine on TDC for cylinder 1 ⇒ [“3.3 Checking valve timing”, page 116](#) .



- Unscrew screws -1- and -3- and remove the bracket -2- for coolant pipe right.



- Unscrew locking screw -arrow- for “TDC” bore at the cylinder block.



- Turn the fixing screw - T10340- into the cylinder block up to the stop and tighten to specified torque ⇒ [page 58](#) .



Note

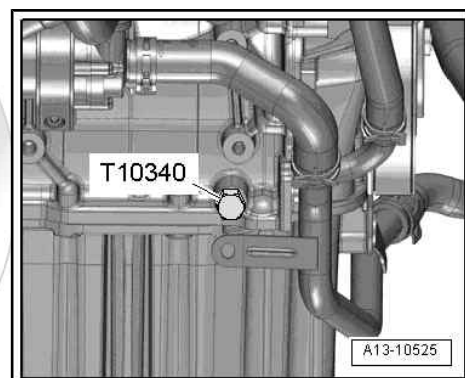
The crankshaft is locked only in direction of rotation of engine with the fixing screw - T10340- .

Counterhold vibration damper with counterholder - T30004- with bolt - T30004/1- .

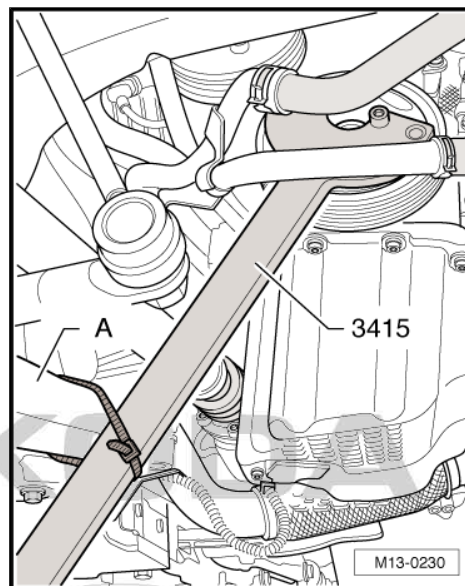


Note

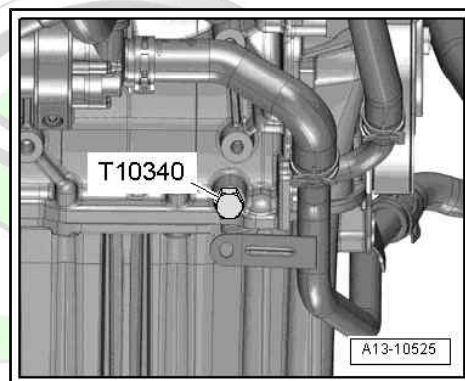
Absolutely use the counterholder - T30004 (3415)- with bolt - T30004/2 (3415/2)- when tightening the fixing screw of the belt pulley in order to avoid damage to the fixing screw.



- Insert counterholder - T30004- with bolt - T30004/1- into the holes of the vibration damper, support counterholder at track control arm -A- and secure in this position with a cable strap. Tighten cable strap.
- Tighten fixing screw for belt pulley.



- Unscrew the fixing screw - T10340- from the cylinder block.



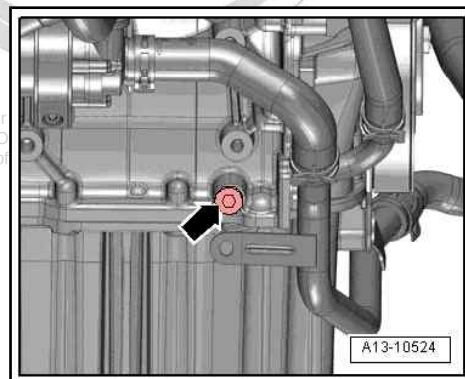
- Screw the screw plug -arrow- into the cylinder block.

Further installation occurs in a similar way in reverse order to removal.

Tightening torques

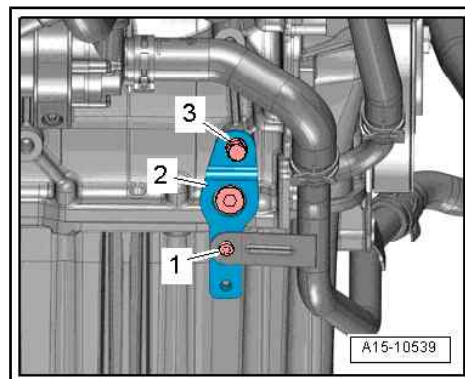
- ◆ Noise insulation ⇒ Body Work- Assembly; Rep. gr. 50

Component	Specified torque
Screw plug for cylinder block	30 Nm
Fixing screw - T10340-	30 Nm



Bracket for coolant pipe

Component	Specified torque
Screw -1-	8 Nm
Screw -3-	40 Nm



1.5 Removing and installing bracket for auxiliary units

Removing

- Remove V-ribbed belt
⇒ [“1.3 Removing and installing V-ribbed belt”, page 54](#) .
- Remove alternator ⇒ Electrical System; Rep. gr. 27 .



WARNING

Risk of injury through refrigerant.

- ◆ *Do not open the refrigerant circuit of the air conditioning system.*

- Disconnect electric plug connection -1- on the control valve for the air conditioning system - N280- compressor.
- Release screws -arrows- for AC compressor.

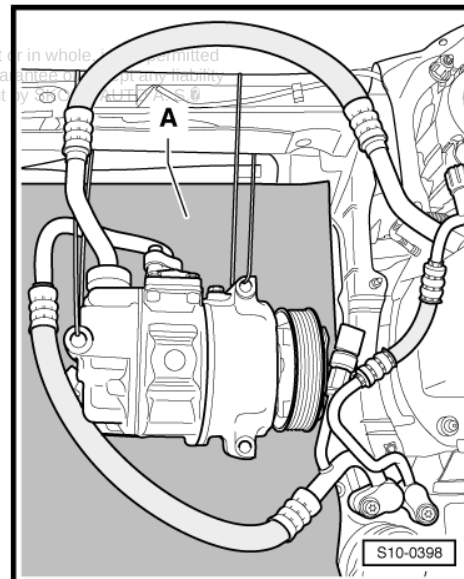
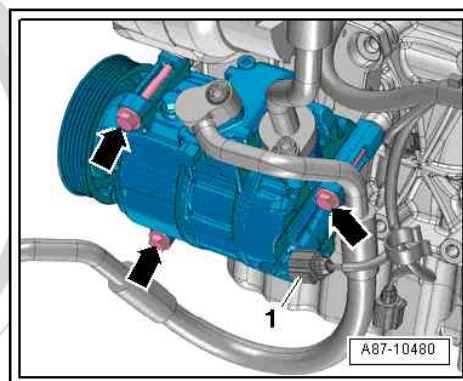


Caution

Risk of damaging AC compressor, refrigerant lines and hoses.

- ◆ *Do not over-tension, buckle or bend refrigerant lines and hoses.*

- Secure AC compressor to the lock carrier with connected hoses. Insert a sheet of cardboard -A- when doing so to protect the radiator.



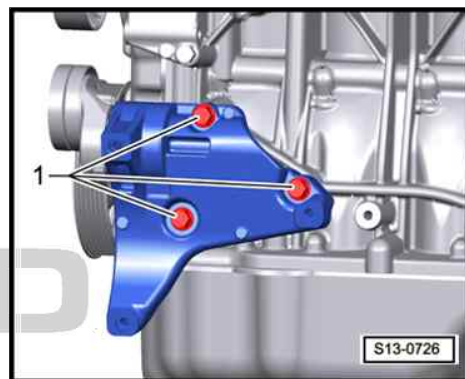
- Unscrew fixing screws -1- and remove holder with tensioning element.

Install

Installation is carried out in the reverse order.

Tightening torques

- ♦ ⇒ [“1.1 Assembly overview - poly V-belt drive”, page 49](#)
- ♦ AC compressor ⇒ Heating, Air Conditioning; Rep. gr. 87
- ♦ AC generator ⇒ Electrical System; Rep. gr. 27



1.6 Replacing crankshaft seal on belt pulley side

Special tools and workshop equipment required

- ♦ Gasket ring extractor - MP 1-226 (3203)-
- ♦ Assembly device - T10117/2-
- ♦ Assembly device - T10053-

Removing

- Remove V-ribbed belt
⇒ [“1.3 Removing and installing V-ribbed belt”, page 54](#) .
- Rotate the crankshaft in direction of rotation of engine on TDC for cylinder 1 ⇒ [“3.3 Checking valve timing”, page 116](#) .
- Remove crankshaft toothed belt sprocket
⇒ [“1.4 Removing and installing ribbed belt pulley”, page 55](#) .
- Unscrew inner part of the gasket ring extractor - MP 1-226 - three turns (approx. 5 mm) out of the outer part and lock with knurled screw.
- Oil the thread head of the gasket ring extractor - MP 1-226 - , position and forcefully screw it into the gasket ring as far as possible.
- Release knurled screw and turn the inner side against the crankshaft until the gasket ring is pulled out.
- Remove the bushing from the crankshaft journal and clean the clamping surfaces of the crankshaft chain sprocket and the bushing.

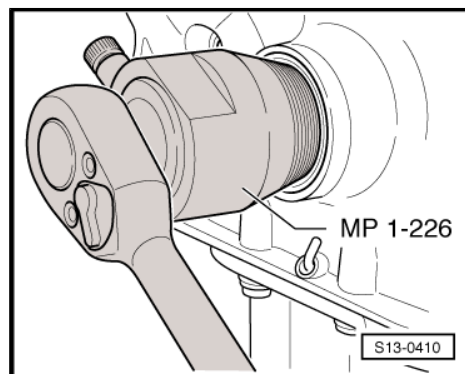
Install



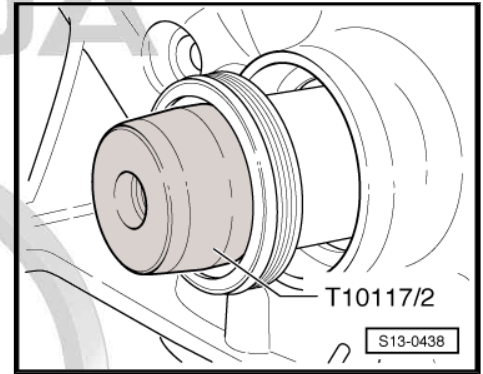
Note

Observe that the clamping surfaces of the belt pulley, the fixing screw, the bushing and the crankshaft chain sprocket are free of oil and grease.

- Replace O-ring in the distance sleeve
⇒ [“2.1 Assembly overview - cylinder block, gearbox end”, page 62](#) .
- Place distance sleeve on the crankshaft journal.



- Place assembly device - T10117/2- on distance sleeve and push on the sealing ring.
- Remove the assembly device - T10117/2- from the distance sleeve.

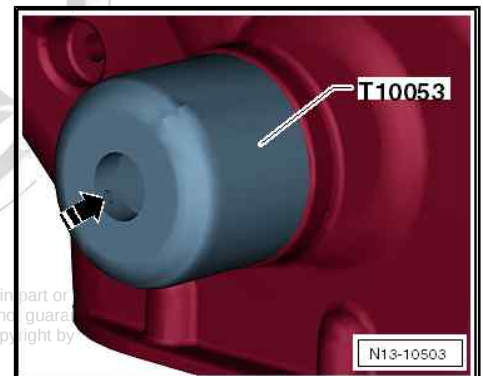


- Press the gasket ring with the assembly device - T10053- by striking uniformly up to the stop in the timing case.
- Install the vibration damper
⇒ [“1.4 Removing and installing ribbed belt pulley”, page 55](#) .

Further installation occurs in a similar way in reverse order to removal.

Tightening torques

- ◆ ⇒ [“1.1 Assembly overview - poly V-belt drive”, page 49](#)





2 Cylinder block, gearbox end

⇒ [“2.1 Assembly overview - cylinder block, gearbox end”, page 62](#)

⇒ [“2.2 Removing and installing flywheel”, page 64](#)

⇒ [“2.3 Removing and installing the sealing flange on the gearbox side”, page 65](#)

2.1 Assembly overview - cylinder block, gearbox end



Note

Repairs to the clutch ⇒ Gearbox; Rep. gr. 30.

1 - Fixing screw

- ☐ Replace after disassembly
- ☐ to release and tighten use counterholder - T30004 (3415)-



Caution

*There is a risk of destruction of the engine.
So as not to adjust the timing the crankshaft must not be turned while the screws are removed.*

- ☐ The clamping surface of the fixing screw must be free of grease and oil.
- ☐ insert oiled (thread)
- ☐ Tightening torque
⇒ [“1.1 Assembly overview - poly V-belt drive”, page 49](#)

2 - Vibration damper

- ☐ Clamping surfaces must be free of oil and grease.



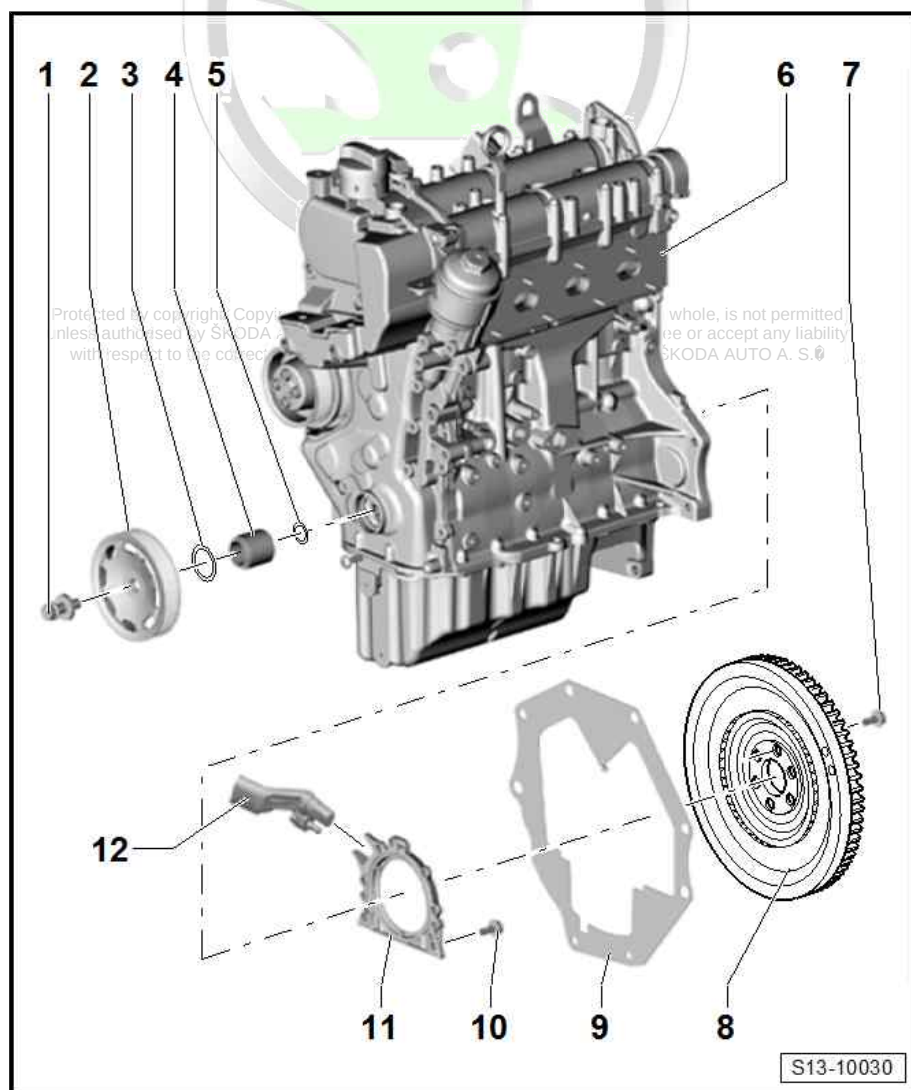
Caution

*There is a risk of destruction of the engine.
So as not to adjust the timing the crankshaft must not be turned while the screws are removed.*

- ☐ removing and installing
⇒ [“1.4 Removing and installing ribbed belt pulley”, page 55](#)
- ☐ Removing and installing V-ribbed belt ⇒ [“1.3 Removing and installing V-ribbed belt”, page 54](#)

3 - Sealing ring

- ☐ for crankshaft in timing case
- ☐ replace after removal ⇒ [“1.6 Replacing crankshaft seal on belt pulley side”, page 60](#)



4 - Distance sleeve

- ☐ The contact surfaces of the distance sleeve must be free of grease and oil.
- ☐ install with new O-ring -Position 5-

5 - O-ring

- ☐ Replace after disassembly
- ☐ in the distance sleeve -Position 4-

6 - Cylinder head

- ☐ removing and installing ⇒ [“1.2 Removing and installing the cylinder head”, page 85](#)

7 - Screw

- ☐ Replace after disassembly
- ☐ 60 Nm + 90°

8 - Flywheel

- ☐ on vehicles with automatic gearbox - the two-mass flywheel version
- ☐ removing and installing ⇒ [“2.2 Removing and installing flywheel”, page 64](#)

9 - Intermediate plate

- ☐ do not damage or bend during assembly work
- ☐ installing ⇒ [Fig. “Installing intermediate plate” , page 64](#)

10 - Screw

- ☐ Replace after disassembly
- ☐ Tightening torque and tightening order
⇒ [Fig. “Sealing flange on the gearbox side - tightening torque and tightening order” , page 63](#)

11 - Sealing flange on the gearbox side

- ☐ Only replace sealing flange complete with gasket ring and rotor
- ☐ removing and installing
⇒ [“2.3 Removing and installing the sealing flange on the gearbox side”, page 65](#)

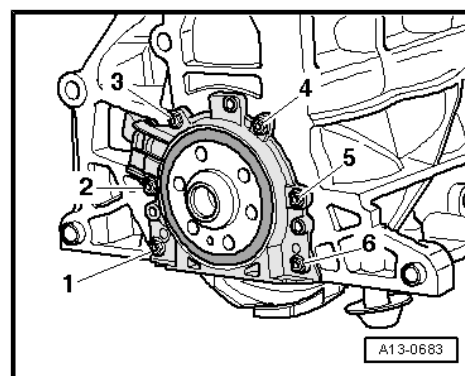
12 - Engine speed sender - G28-

- ☐ with captive screw
- ☐ removing and installing ⇒ [“1.3 Removing and installing engine speed sender G28 ”, page 316](#)
- ☐ Tightening torque ⇒ [“1.1 Assembly overview - ignition system”, page 314](#)

Sealing flange on the gearbox side - tightening torque and tightening order

– Tighten screws in steps as follows:

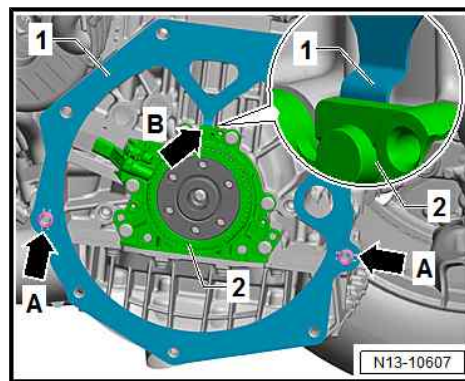
Stage	Screws	Specified torque
1.	-1-...-6-	by hand as far as the stop
2.	-1-...-6-	tighten crosswise in steps up to 10 Nm





Installing intermediate plate

- Mount intermediate plate -1- on sealing flange -arrow B- and push onto the dowel sleeves -arrows A-.



2.2 Removing and installing flywheel

Special tools and workshop equipment required

- ♦ Counterholder - MP 1-223 (3067)-

or

- ♦ Engine mount - MP 1-202 (VW 540)-
- ♦ Bushing - T30010 (VW 540/1B)-
- ♦ Flywheel lock - MP 1-504-

Removing

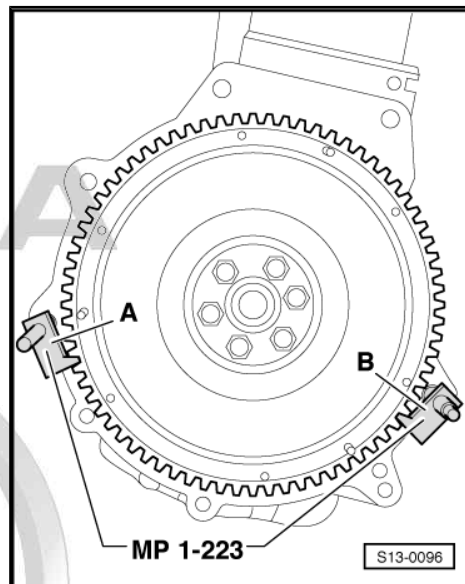
- Gearbox is removed.
- Remove clutch on vehicles with manual gearbox ➔ Gearbox; Rep. gr. 30 .

Engine installed

- Insert the counterholder - MP 1-223 (3067)- into the bore hole on the cylinder block.
- Fitting position of the counterholder:

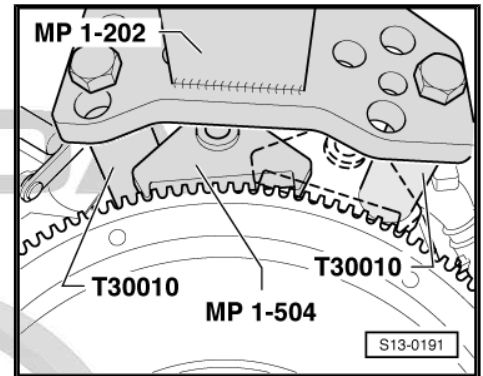
A - for tightening

B - for slackening



Engine removed

- Position the flywheel lock - MP 1-504- on the starter ring gear of the flywheel and turn crankshaft until the lock rests against the sleeve - T30010- .



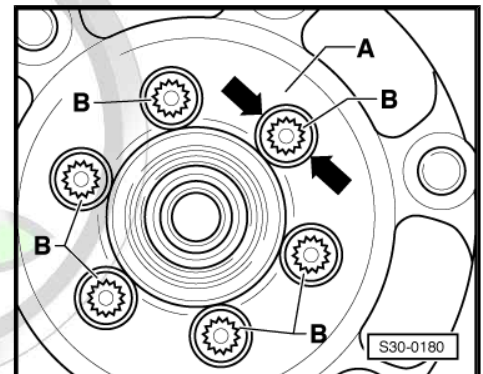
Vehicles with two-mass flywheel

- Rotate the secondary side -A- of the two-mass flywheel in such a way that the screws -B- are positioned in the middle of the holes -arrows-.



Caution

When unscrewing the screws -B-, ensure that no screw head catches on the secondary side -A- of the two-mass flywheel, otherwise the flywheel will be damaged.



Continued for all vehicles

- Unscrew screws -B- and remove flywheel.

Install

Installation is carried out in the reverse order. When installing, observe the following:



Note

Use new screws for attaching.

Vehicles with two-mass flywheel

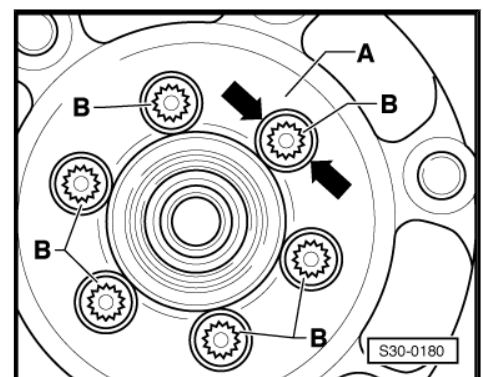
- Rotate the secondary side -A- of the two-mass flywheel in such a way that the screws -B- are positioned in the middle of the holes -arrows-.

Continued for all vehicles

- Screw in all the screws -B- by hand.
- Tighten all screws -B- crosswise to torque.
- Turn all screws -B- crosswise by specified angle.

Tightening torques

- ["2.1 Assembly overview - cylinder block, gearbox end", page 62](#)



2.3 Removing and installing the sealing flange on the gearbox side

Special tools and workshop equipment required

- ◆ Assembly device - T10134-
- ◆ Feeler gauges



- ◆ Steel straightedge
- ◆ Screw M6 x 35 (3 pieces)
- ◆ Screw M7 x 35 (2 pieces)

Removing

- Gearbox is removed.



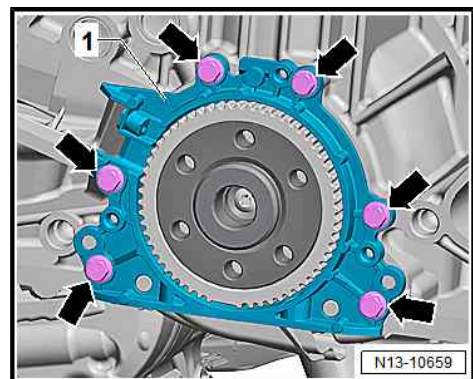
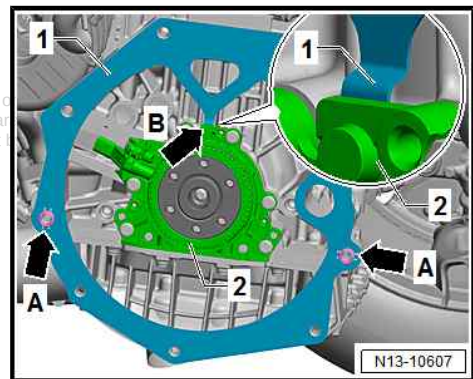
Note

- ◆ For a clearer illustration, see the work sequences while the engine is removed.
- ◆ The procedure is identical whether the engine is installed or removed.
- Remove the flywheel
⇒ [“2.2 Removing and installing flywheel”, page 64](#) .
- Remove intermediate plate -1- from the dowel sleeves arrow -A-.
- Raise intermediate plate and pull out retaining lug -B- from the sealing flange -2-.
- Position engine on TDC for cylinder 1
⇒ [“3.3 Checking valve timing”, page 116](#) (do not remove the screw cap for the camshafts).
- Removing the oil pan
⇒ [“1.3 Removing and installing oil pan”, page 140](#) .
- Remove engine speed transmitter - G28-
⇒ [“1.3 Removing and installing engine speed sender G28 ”, page 316](#) .
- Unscrew screws -arrows- for the sealing flange -1-.



Note

Sealing flange and rotor are pressed together with three M6 x 35 mm screws from the crankshaft.



i Note

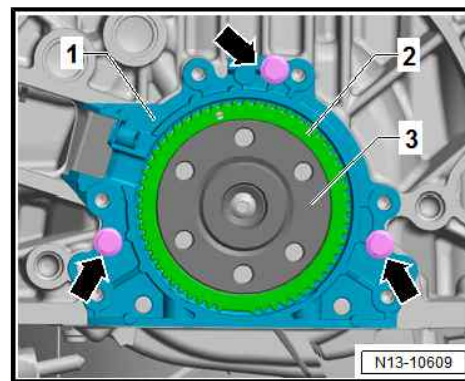
The sealing flange -1- is pressed together with the sensor rotor -2- from the crankshaft -3-.

- To press out, insert 3 screws M6x35 -arrows- into the sealing flange -1- alternately by a maximum of $1/2$ turns each.
- Remove sealing flange -1- with sensor rotor -2-.

Install

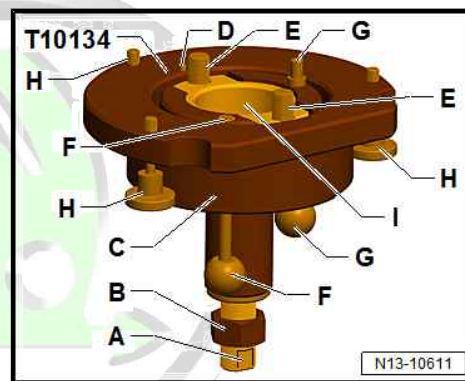
i Note

- ◆ *The sealing flange with PTFE gasket ring is provided with sealing lip supporting ring. This supporting ring is intended as an assembly sleeve and must not be removed before installing.*
- ◆ *Sealing flange and sender wheel must not be separated or turned after removal from packaging.*
- ◆ *The rotor is given its fitting location by fixing it to the positioning pin of the assembly tool - T10134- .*
- ◆ *The sealing flange and gasket ring form one unit and must be replaced together with the rotor.*
- ◆ *The assembly device - T10134- is held in its position relative to the crankshaft by a guide pin that is inserted into a hole in the crankshaft.*



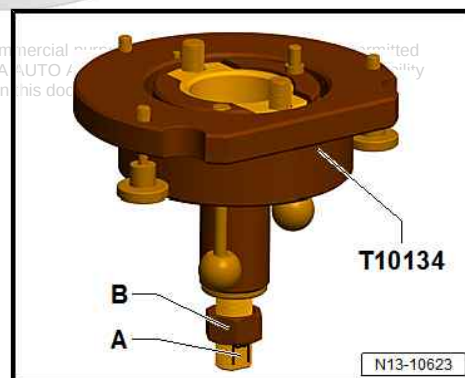
Removing the assembly tool - T10134- :

- A - Clamping surface
- B - Nut
- C - Assembly housing
- D - Positioning pin
- E - Allan screws (2 pieces)
- F - Guide screws (for petrol engines)
- G - Guide screws (for diesel engines)
- H - Knurled screws (3 pieces)
- I - Inner part



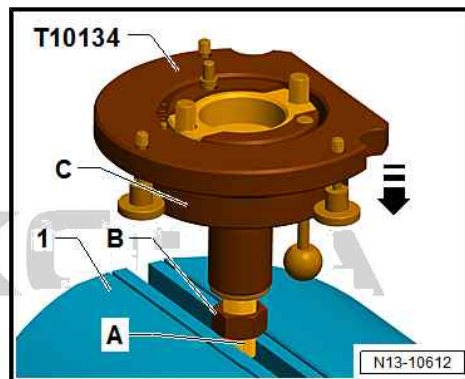
A - place sealing flange with sensor rotor onto assembly tool - T10134- :

- Untwist nut -B- until just before it touches the clamping surface -A- of the threaded spindle.





- Clamp assembly tool - T10134- on clamping surface -A- of the threaded spindle in a vice -1-.
- Push assembly cup -C- down so that it rests on the nut -B- -arrow-.
- Screw nut onto threaded spindle until inner part of assembly tool and assembly housing are at same height.

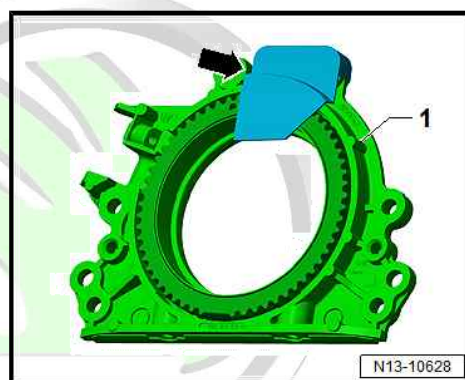


- Remove the securing clip -arrow- from the new sealing flange.



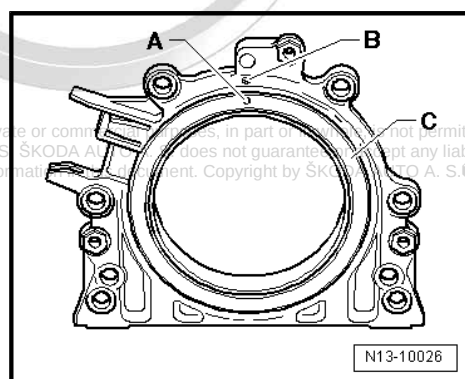
Note

Do not twist rotor or take it out of the sealing flange.

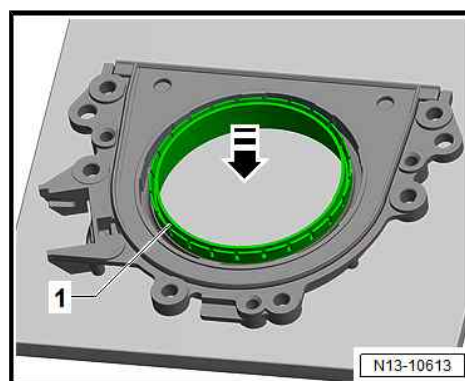


Locating hole -A- on sender wheel -C- must align with marking -B- on sealing flange.

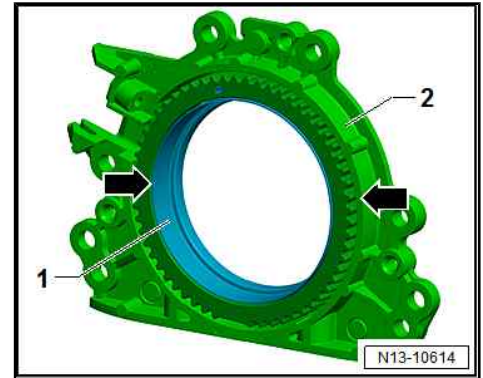
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- Lay the front side of the sealing flange on a clean and level surface.
- Press down sealing lips supporting ring -1- in -direction of the arrow-, until it rests on the level surface.



- Upper edge of sealing lip support ring -1- and front edge of sealing flange -2- must align -arrows-.

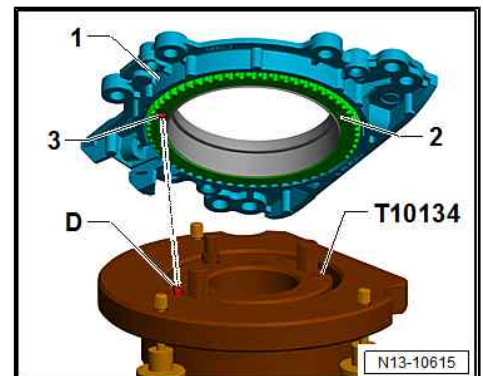


- Lay the sealing flange -1- with the front side on the assembly tool - T10134- in such a way that the positioning pin -D- engages into the hole -3- of the rotor -2-.



Note

Sealing flange must lie straight on the assembly tool.

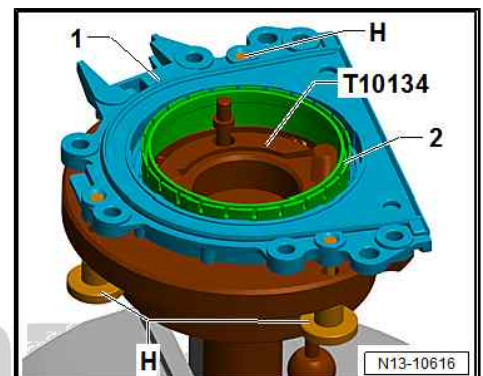


- Press on the sealing flange -1- and sealing lip supporting ring -2- by tightening the 3 knurled screws -H- onto the surface of the assembly tool - T10134- .



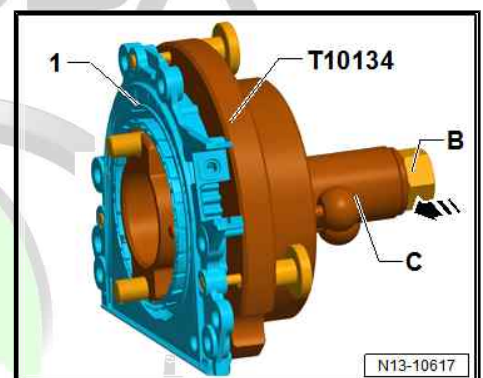
Note

- ◆ *This prevents locating pin from slipping out of sender wheel hole.*
- ◆ *When installing sealing flange, ensure that sender wheel remains fixed in assembly tool.*



B - secure assembly tool - T10134- with sealing flange onto the crankshaft flange and cylinder block

- Crankshaft flange free from oil and grease.
- Engine on "TDC".
- Screw nut -B- on until it reaches end of threaded spindle.
- Press the threaded spindle on the assembly tool - T10134- in -direction of arrow- until the nuts -B- rest against the assembly cup -C-.
- Align flat side of assembly housing to the cylinder block sealing surface on the oil sump side.



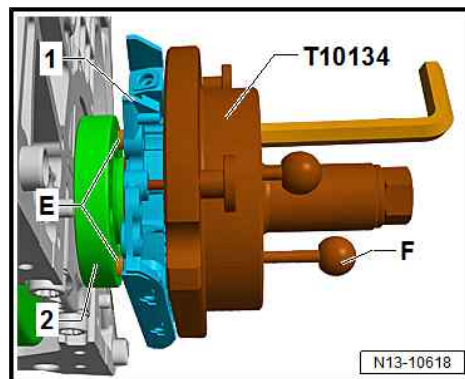


- Secure the assembly tool - T10134- together with the sealing flange -1- with Allan screws -E- to the crankshaft flange.

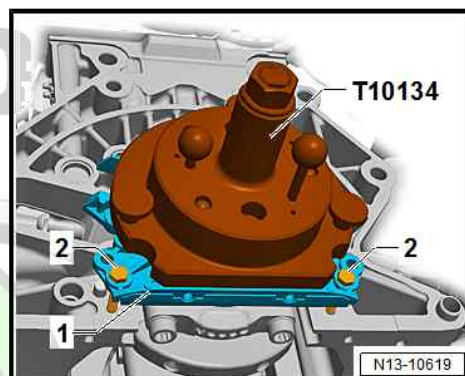


Note

Screw in Allan screws -E- into the crankshaft flange by approx. five thread turns.



- Screw in two M6x35 mm screws -2- by about 3 turns for sealing flange guide -1- into the cylinder block.



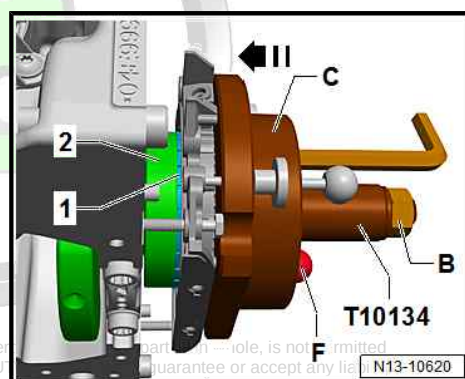
Screw C - attach assembly tool - T10134- onto crankshaft flange

- Push the assembly cup -C- by hand in the -direction of the arrow- until the sealing lip supporting ring -1- rests on the crankshaft flange -2-.
- Push guide pin for petrol engines (red knob) -F- into hole in crankshaft. This gives the rotor its final fitting location.



Note

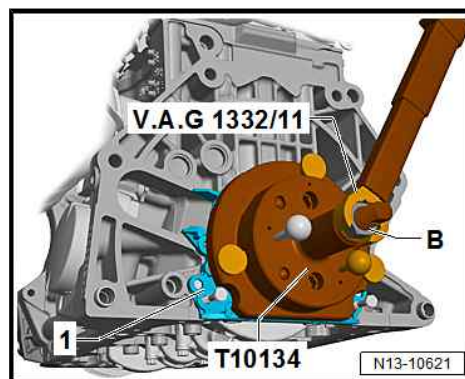
The guide pin for diesel engines must not be inserted in threaded hole of crankshaft.



- Tighten the two hexagon socket head bolts of the assembly tool hand-tight.
- Screw nut -B- onto threaded spindle by hand until it lies against assembly housing -C-.

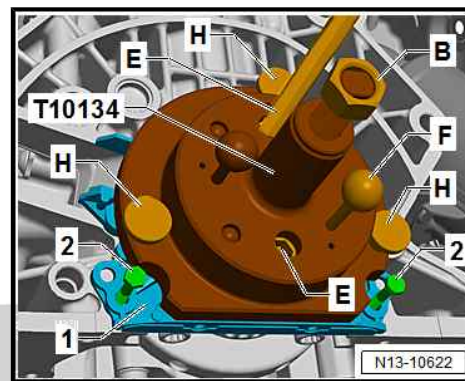
Press D - sensor rotor with assembly tool - T10134- onto crankshaft flange:

- Tighten nut -B- of the assembly tool - T10134- to 35 Nm.
- After nut is tightened to 35 Nm, a small air gap must still be present between cylinder block and sealing flange -1-.

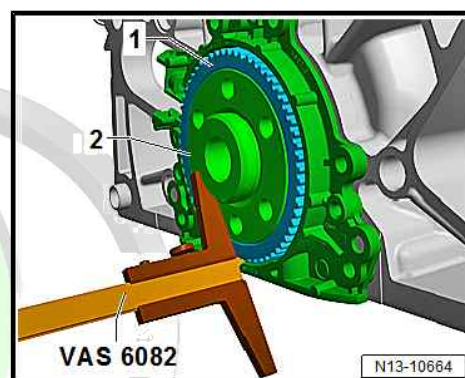


E - Inspect the installation position of the rotor on the crankshaft

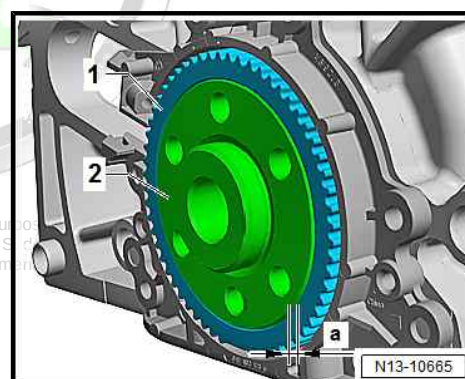
- Screw nut -B- on until it reaches end of threaded spindle.
- Unscrew both bolts-2- from the cylinder block.
- Unscrew knurled screws -H- from the sealing flange -1-.
- Unscrew Allan screws -E- from the crankshaft flange.
- Remove assembly tool - T10134- .
- Remove sealing lip supporting ring.



- Mount depth gauge onto the crankshaft flange -2-.



- Measure distance -a- between crankshaft flange -2- and sensor rotor -1-.
- Specified value: Dimension -a- = 0.5 mm.
- If the specified value is too small, press rotor down
⇒ [page 71](#) .
- When the specified value has been reached, perform the re-
maining assembly ⇒ [page 72](#) .



F - Pressing down the rotor

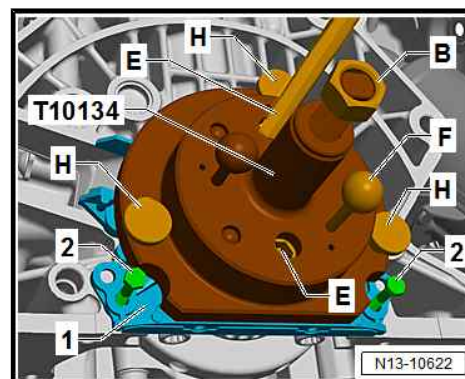
- Secure assembly tool - T10134- to crankshaft flange with hexagon socket head bolts -E-.



Note

Make sure the positioning pin on the assembly tool - T10134- engages in the bore of the sensor rotor.

- Tighten the two hexagon socket head bolts -E- hand-tight.
- Screw the knurled screws -H- into the sealing flange -1-.
- Screw nut -B- onto threaded spindle by hand until it lies against the assembly housing.



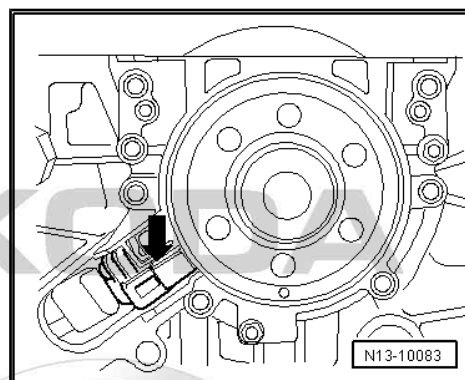
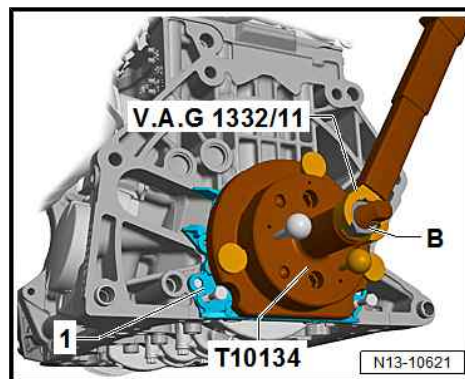
- Tighten nut -B- of the assembly tool - T10134- to 40 Nm.
- Checking sender wheel installation position on crankshaft again ⇒ [page 71](#) .
- If the setpoint value is too small, tighten the nuts on the assembly tool - T10134- to 45 Nm.
- Checking sender wheel installation position on crankshaft again ⇒ [page 71](#) .

Assembling together

- Tighten screws for sealing flange crosswise.
- Install engine speed sender - G28-
⇒ ["1.3 Removing and installing engine speed sender G28"](#), [page 316](#) .
- Installing the oil pan
⇒ ["1.3 Removing and installing oil pan"](#), [page 140](#) .
- Installing intermediate plate
⇒ [Fig. "Installing intermediate plate"](#), [page 64](#) .
- Install flywheel
⇒ ["2.2 Removing and installing flywheel"](#), [page 64](#) .

Tightening torques

- ◆ Sealing flange on the gearbox side
⇒ [Fig. "Sealing flange on the gearbox side - tightening torque and tightening order"](#), [page 63](#)
- ◆ ⇒ ["1.3 Removing and installing engine speed sender G28"](#), [page 316](#)
- ◆ ⇒ ["1.1 Assembly overview - sump/oil pump"](#), [page 137](#)
- ◆ ⇒ ["2.1 Assembly overview - cylinder block, gearbox end"](#), [page 62](#)



3 Crankshaft

⇒ [“3.1 Summary of components - crankshaft”, page 73](#)

⇒ [“3.2 Removing and installing the crankshaft needle bearing”, page 74](#)

3.1 Summary of components - crankshaft



Note

If considerable quantities of metal swarf or abrasion is found when carrying out engine repairs, this can be subject to damage to the crankshaft and conrod bearings. In order to avoid consequential damage, after the repair perform the following tasks:

- Carefully clean the oil galleries.
- Replace oil spray jets.
- Replace engine oil cooler.
- Replace oil filter.

1 - Screw

- ☐ 50 Nm + 90°

2 - Bearing caps

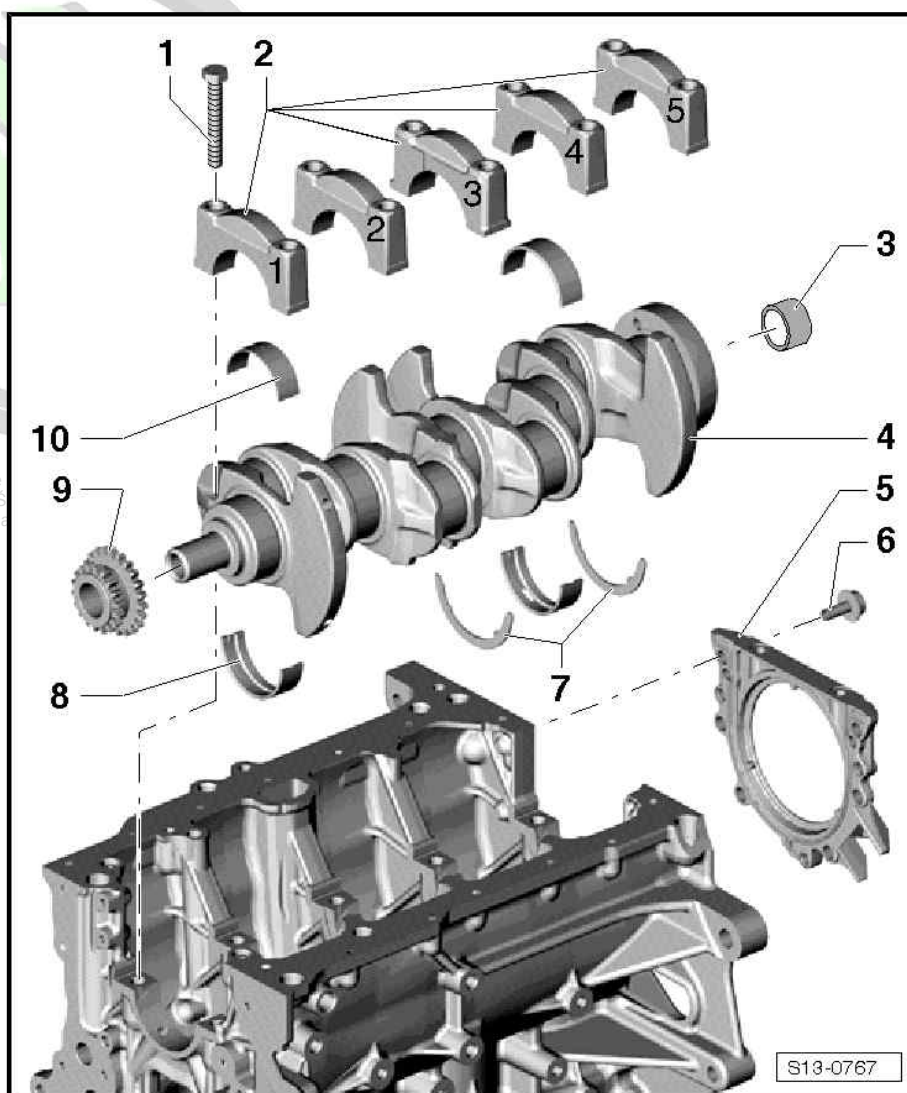
- ☐ do not mix up bearing cap (mark)
- ☐ bearing cap 3 with recesses for thrust washers
- ☐ retaining lugs of the bearing shells of the cylinder block/bearing cap must be on top of one another

3 - Needle bearing

- ☐ only on vehicles with automatic gearbox
- ☐ removing and installing
⇒ [“3.2 Removing and installing the crankshaft needle bearing”, page 74](#)

4 - Crankshaft

- ☐ New axial clearance: 0.07...0.24 mm
- Wear limit: 0.26 mm
- ☐ Crankshaft bearing journals: $\varnothing$ 54.00 mm
- ☐ Conrod bearing journals: $\varnothing$ 47.80 mm
- ☐ on vehicles with automatic gearbox with needle bearing
- ☐ Pulling out and driving in the needle bearing for crankshaft ⇒ [“3.2 Removing and installing the crankshaft needle bearing”, page 74](#)



5 - Sealing flange on the gearbox side

- ☐ Only replace sealing flange complete with gasket ring and rotor
- ☐ Replace. ⇒ ["2.3 Removing and installing the sealing flange on the gearbox side", page 65](#) .

6 - Screw

- ☐ Tightening torque ⇒ ["2.1 Assembly overview - cylinder block, gearbox end", page 62](#)

7 - Thrust washers

- ☐ for bearing cap 3
- ☐ pay attention to locating element

8 - Bearing shell

- ☐ in cylinder block

9 - Sprocket

- ☐ removing and installing
⇒ ["3.2 Removing and installing timing chain and drive chain for oil pump", page 108](#)
- ☐ for oil pump drive and timing chain
- ☐ Contact surfaces must be free of oil and grease

10 - Bearing shell

- ☐ in bearing cap
- ☐ do not mix up used bearing shells (mark)

3.2 Removing and installing the crankshaft needle bearing

Special tools and workshop equipment required

- ◆ Interior extractor - Kukko 21/2-
- ◆ Countersupport - Kukko 22/1-
- ◆ Centering mandrel - T30029 (3176)-



Note

Only on vehicles fitted with automatic gearbox.

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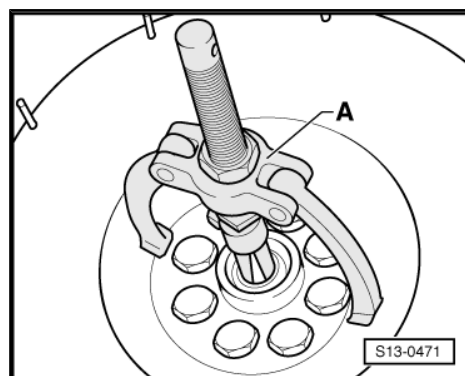
Removing

- Pull out with interior extractor with counter support -A-, e.g. Kukko 21/2 with Kukko 22/1.

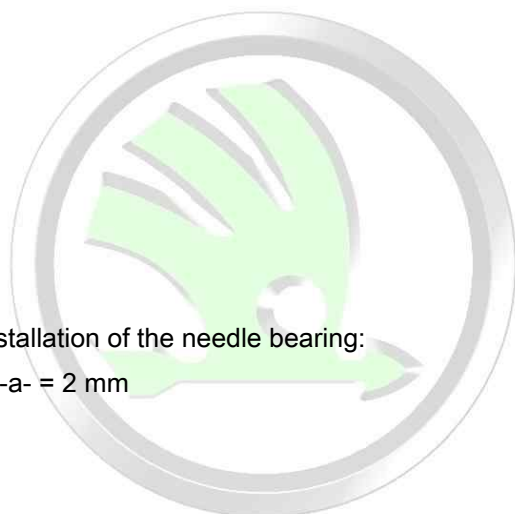
Install

Fitting position of the needle bearing:

- ◆ The open side of the needle bearing with sealing ring must be visible when in its installed condition.

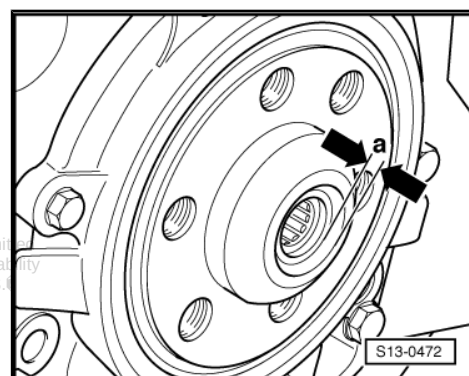
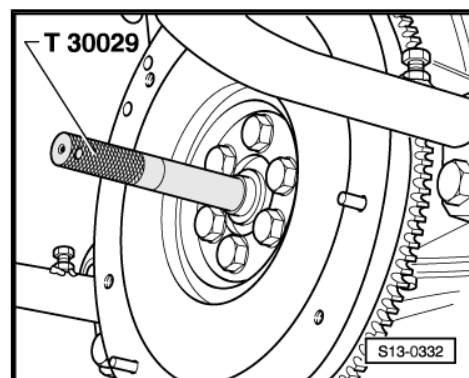


- Drive in using a centering pin - T30029- .



- Depth of installation of the needle bearing:
- ◆ Dimension -a- = 2 mm

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4 Pistons and conrods

⇒ "4.1 Assembly overview - piston and conrod", page 76

⇒ "4.2 Checking piston and cylinder bore", page 78

⇒ "4.3 Separating new conrod", page 80

4.1 Assembly overview - piston and conrod



Note

Before assembly, oil all bearing and contact surfaces.

1 - Circlip

- ☐ 2 pieces
- ☐ Replace after disassembly

2 - Piston pin

- ☐ if stiff, heat piston to approx. 60°C
- ☐ use drift - T10046- for removing and installing

3 - Piston

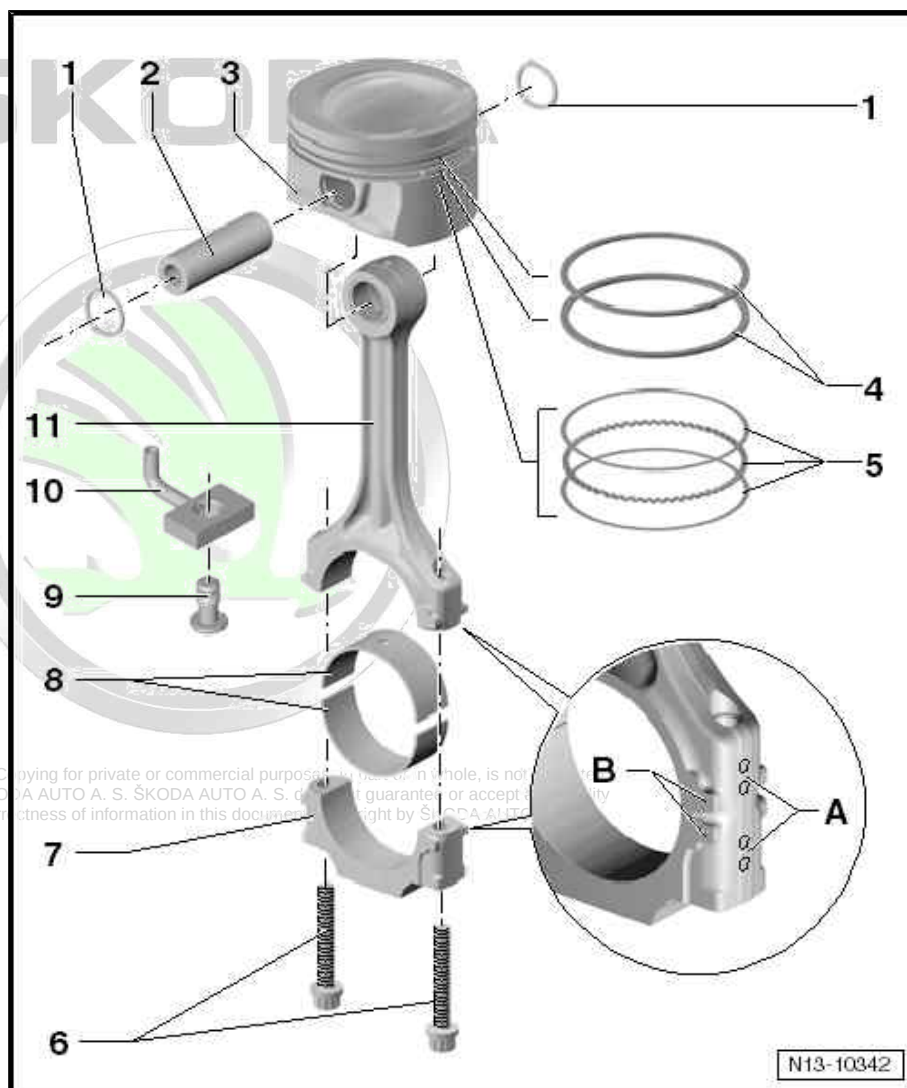
- ☐ Inspecting piston
⇒ Fig. "Inspecting pistons", page 79
- ☐ inspect cylinder bore
⇒ Fig. "Inspecting cylinder bore", page 79
- ☐ Mark the installation position and the assignment to cylinder
⇒ Fig. "Fitting position of piston and assignment of piston to cylinder", page 77
- ☐ use piston ring tensioning strap for installing
- ☐ Piston $\varnothing$: 76.46 mm (nominal dimension)

4 - Compression rings

- ☐ Offset joint 120°
- ☐ Remove and install compression rings with piston ring pliers.
- ☐ "TOP" faces towards piston crown.
- ☐ Inspect gap clearance ⇒ Fig. "Checking piston ring gap", page 78
- ☐ Inspect end clearance ⇒ Fig. "Inspect piston ring end clearance", page 78

5 - Oil scraper rings

- ☐ Carefully remove and install 3-part oil scraper rings by hand.
- ☐ Inspect gap clearance ⇒ Fig. "Checking piston ring gap", page 78
- ☐ Ring-to-groove clearance not measurable.



6 - Screw

- ☐ Replace after disassembly
- ☐ Oil thread and contact surface
- ☐ 30 Nm + 90°

7 - Conrod bearing cap

- ☐ As a result of the conrods separated in the cracking process, the cover fits only in one position and only to the relevant conrod
- ☐ Mark with cylinder number prior to removal -A-.
- ☐ Fitting position: Mark -B- points to belt pulley end (if mark is missing, mark before removing)

8 - Bearing shell

- ☐ Fitting position ⇒ Fig. [“Bearing shell installation position”](#), page 78
- ☐ Do not interchange used bearing shells.
- ☐ Insert bearing shells centrally.

9 - Pressure relief valve

- ☐ Opening pressure: 0,18 ... 2.2 MPa (1.8 ... 2.2 bar)
- ☐ 27 Nm

10 - Oil injection nozzle

- ☐ for cooling pistons

11 - Conrod

- ☐ always replace as a set only
- ☐ Mark with cylinder number -A-.
- ☐ Fitting position: Mark -B- points to belt pulley end (if mark is missing, mark before removing)
- ☐ Guided axially by piston.
- ☐ separate new connecting rod ⇒ [“4.3 Separating new conrod”](#), page 80

Fitting position of piston and assignment of piston to cylinder

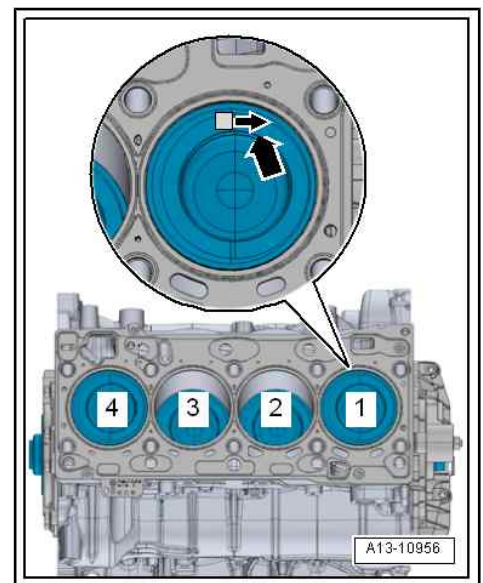


Caution

Risk of damaging the piston crown.

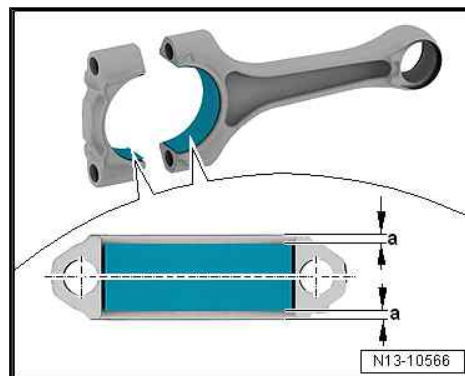
- ◆ *For reinstallation: mark the assignment of pistons that have already been used to the cylinder in colour on the piston crown. Do not mark piston crown not using centre punch, scratch, nick or similar.*

- Arrow on the piston crown to the belt pulley side -arrow-.



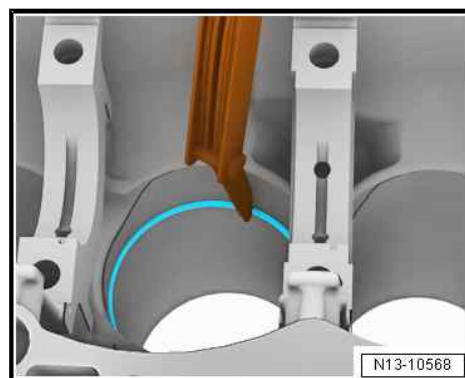
Bearing shell installation position

- Insert bearing shells centrally in the conrod and conrod bearing cap.
- Dimension -a- = 2.5 mm.



4.2 Checking piston and cylinder bore

Checking piston ring gap

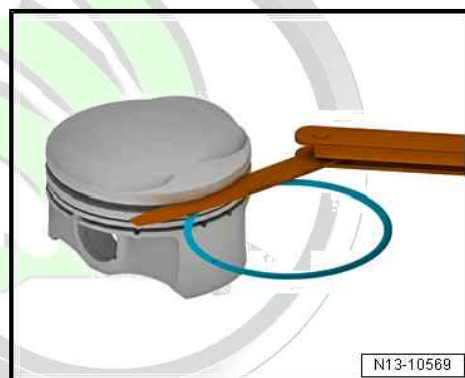


Special tools and workshop equipment required

- ♦ Feeler gauges
- Push piston ring squarely from above down into cylinder bore to approx. 15 mm from bottom end of cylinder. To insert use piston without rings.
- Push a commercially available feeler gauge into the piston ring opening to check the end gap.

Piston ring	New mm	Wear limit mm
1. Compression ring	0,20...0,40	1,0
2. Compression ring	0,40...0,60	1,0
Oil scraper ring	0,20...0,8	no wear indication possible

Inspect piston ring end clearance



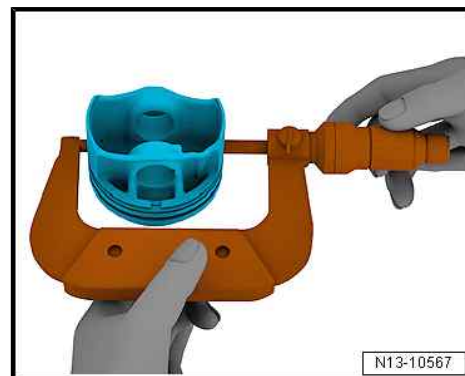
Special tools and workshop equipment required

- ♦ Feeler gauges
- Clean annular groove before check.

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Piston ring	New mm	Wear limit mm
1. Compression ring	0,04...0,08	0,15
2. Compression ring	0,02...0,06	0,15
Oil scraper ring	Not measurable	

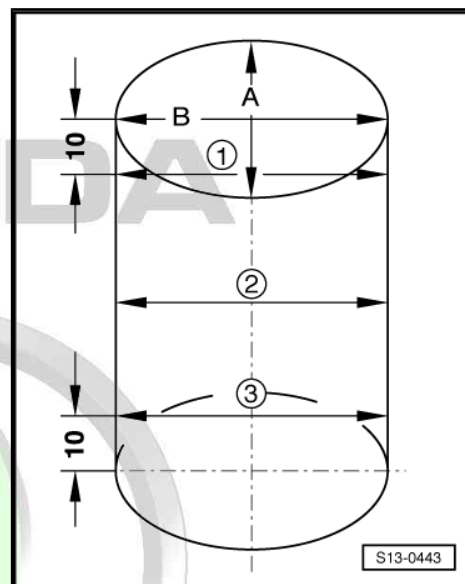
Inspecting pistons



Special tools and workshop equipment required

- ◆ External micrometer 75...100 mm
- Measure about 12 mm from the lower edge and vertically off-set to piston pin axis.
- Deviations from nominal dimension: max. 0.04 mm

Inspecting cylinder bore



Special tools and workshop equipment required

- ◆ Internal precision measuring instrument 50...100 mm



Caution

There is risk of damaging the cylinder bore surface.

- ◆ *Do not use normal workshop equipment to work on cylinder bore (boring, honing, grinding).*

- Measure at three points crosswise in a transverse direction -A- and lengthwise -B-.
- Deviations from nominal dimension: max. 0.08 mm



Note

Do not measure the cylinder bore if the cylinder block is fixed to the assembly stand - MP 1-202- with the engine mount - MP 9-101- , as this may result in incorrect measurements.

4.3 Separating new conrod

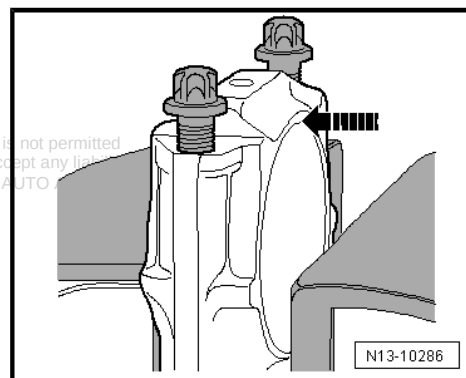
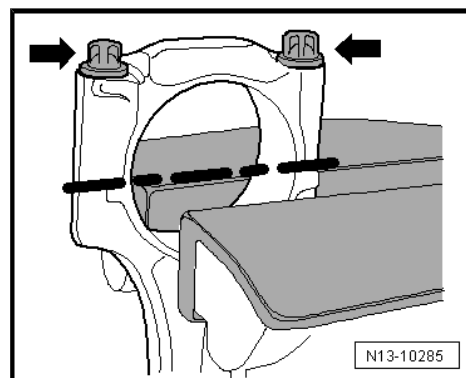
It can happen that on new connecting rods, the provided separation point is not completely cracked. If the conrod bearing cap cannot be removed by hand, then proceed as follows:

- Mark the assignment of the conrod to the cylinder.
- Slightly tension the conrod, as shown in the illustration, in a vice with aluminium protective jaws.



Note

- ◆ *Only tension the conrod slightly in order to avoid damage on the conrod.*
- ◆ *The conrod is clamped below the broken line.*
- Unscrew both screws -arrows- by approx. 5 turns.
- Carefully knock against the conrod bearing cap with a rubber hammer in -direction of arrow- in order to loosen it.



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15 – Cylinder head, valve gear

1 Cylinder head

⇒ [“1.1 Summary of components - cylinder head”, page 81](#)

⇒ [“1.2 Removing and installing the cylinder head”, page 85](#)

⇒ [“1.3 Removing and installing camshaft housing”, page 88](#)

⇒ [“1.4 Testing the compression”, page 94](#)

⇒ [“1.5 Checking the combustion chamber for tightness”, page 95](#)

1.1 Summary of components - cylinder head

Testing compression pressure

⇒ [“1.4 Testing the compression”, page 94](#) .



Note

- ◆ *When installing a replacement cylinder head, all the contact surfaces between the supporting elements, roller rocker arms and the cam tracks must be oiled before installing the camshaft housing.*
- ◆ *Do not remove the plastic bases supplied as a protection for the open valves until just before fitting on the cylinder head.*
- ◆ *If the cylinder head is replaced, also the entire coolant must be replaced.*
- ◆ *Before assembly moisten all bearing points and contact surfaces with oil.*
- ◆ *Removing and installing intake manifold* ⇒ [“4.2 Removing and installing intake manifold”, page 281](#) .

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1 - Screw

- ☐ Replace after disassembly
- ☐ Tightening torque
⇒ ["7.1 Summary of components - high pressure pump", page 297](#)

2 - High pressure pump

- ☐ for fuel supply
- ☐ with fuel pressure regulating valve - N276-
- ☐ removing and installing
⇒ ["7.2 Removing and installing the high pressure pump", page 299](#)

3 - Cable guide

- ☐ screwed to camshaft housing
- ☐ 5 Nm

4 - to air filter

5 - Screw

- ☐ 10 Nm

6 - Hall sender - G40-

- ☐ with O-ring
- ☐ replace the O-ring if it is damaged

7 - Screw

- ☐ Replace after disassembly
- ☐ pay attention to sequence for loosening and tightening
⇒ [Fig. "Camshaft housing - loosening sequence", page 84](#)
- ☐ Tightening torque and tightening order
⇒ [Fig. "Camshaft housing - tightening torque and tightening order", page 85](#)

8 - Camshaft housing

- ☐ removing and installing ⇒ ["1.3 Removing and installing camshaft housing", page 88](#)

9 - Screw

- ☐ 20 Nm

10 - Shackle

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11 - Exhaust gas turbocharger

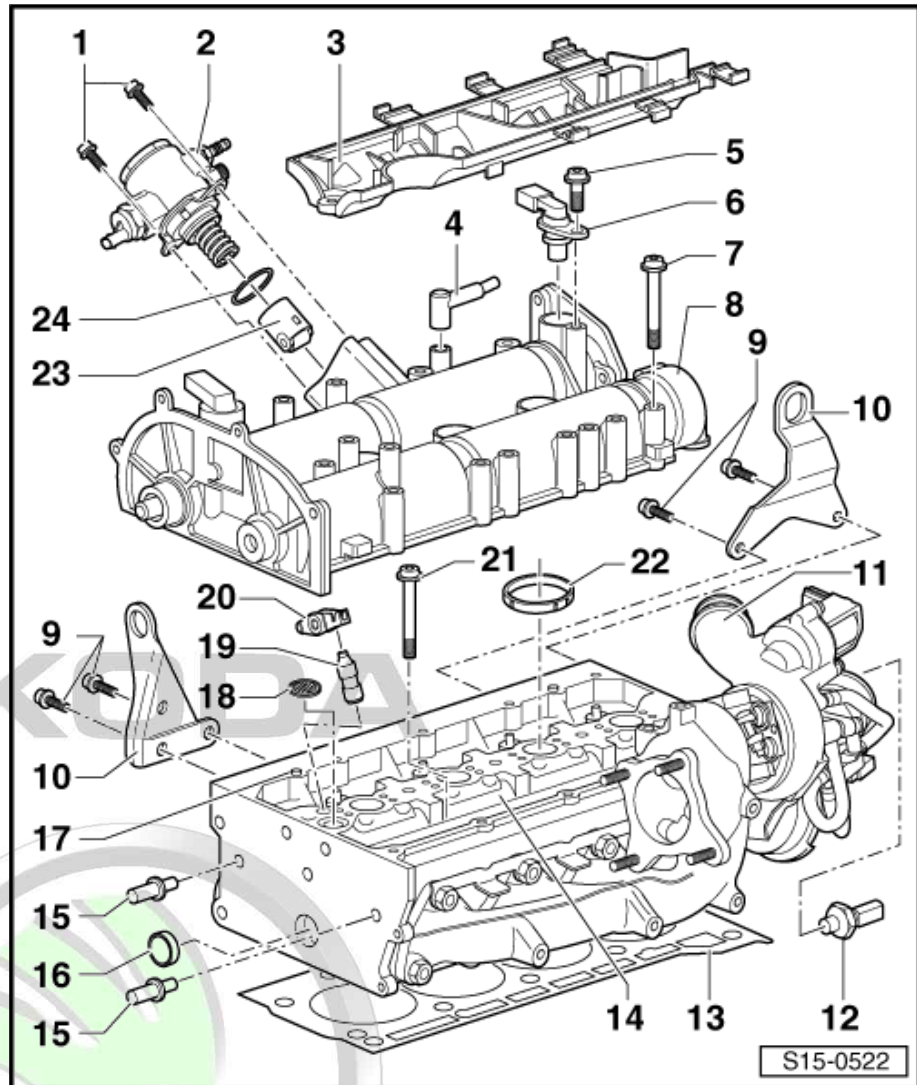
- ☐ removing and installing
⇒ ["1.2.1 Removing and installing the exhaust gas turbocharger with exhaust manifold", page 238](#)

12 - Oil pressure switch - F1-

- ☐ If the sealing ring is leaking, replace sealing ring with new sealing ring ⇒ ETKA - Electronic Catalogue of Original Parts
- ☐ checking ⇒ ["3.1 Testing oil pressure and oil pressure switch", page 148](#) .
- ☐ Fitting position
⇒ [Fig. "Fitting location of the oil pressure switch -F1- and tightening torque", page 140](#)
- ☐ 20 Nm

13 - Cylinder head gasket

- ☐ Replace after disassembly



- ☐ metal gasket
- ☐ after replacing fill entire system with fresh coolant

14 - Cylinder head

- ☐ Sealing surfaces to the camshaft housing must be free of oil and grease.
- ☐ after replacing fill entire system with fresh coolant
- ☐ removing and installing ⇒ [“1.2 Removing and installing the cylinder head”, page 85](#)
- ☐ check for distortion ⇒ [Fig. “Inspecting the cylinder head for distortion”, page 85](#)

15 - Guide bolt

- ☐ 20 Nm

16 - Screw cap

- ☐ replace if leaking

Removing:

- Pierce through the centre using an expanding mandrel and pull out as straight as possible using a suitable tool.



Note

Make sure the sealing surface on the cylinder head is not damaged.

Installing:

- Thoroughly clean the sealing surface in the cylinder head
- Thinly coat the new cap sideways all around with securing sealant ⇒ ETKA - Electronic catalogue of original parts .
- Drive screw cap with drift pin e.g. pressure plate - MP 3-410 (VW 434)- straight into the hole.



Note

The cap must be approx. 1 mm deep in relation to the end face of the cylinder head.

- Wipe off any securing sealant that is oozing out.
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17 - Fit pin

18 - Oil strainer

- ☐ inserted into the cylinder head
- ☐ Replace after disassembly

19 - Hydraulic balancing element

- ☐ do not interchange
- ☐ before installing check axial play of the camshafts ⇒ [“4.2 Measuring axial play of camshaft”, page 128](#)
- ☐ Check oil bore
- ☐ oil contact surfaces

20 - Roller rocker arm

- ☐ inspect roller bearings for smooth operation
- ☐ oil contact surfaces
- ☐ for installing, clip onto the balancing element with the locking clip

21 - Screw

- ☐ Replace after disassembly
- ☐ Note installation position ⇒ [“1.2 Removing and installing the cylinder head”, page 85](#)



- ☐ pay attention to sequence for loosening and tightening
 ⇒ Fig. "Cylinder head - loosening sequence", page 84
- ☐ Tightening torque and tightening order
 ⇒ Fig. "Cylinder head - tightening torque and tightening order", page 84

22 - Sealing ring

- ☐ Replace after disassembly
- ☐ 4 pieces
- ☐ inserted into the cylinder head

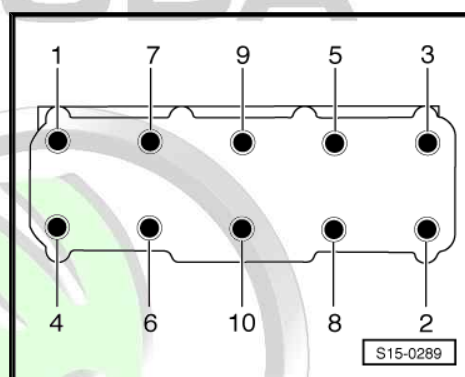
23 - Roller tappet

- ☐ Lightly moisten the contact surface with engine oil

24 - O-ring

- ☐ Replace after disassembly
- ☐ moisten with oil before inserting

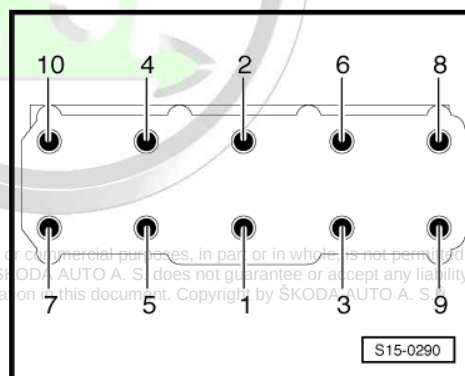
Cylinder head - loosening sequence



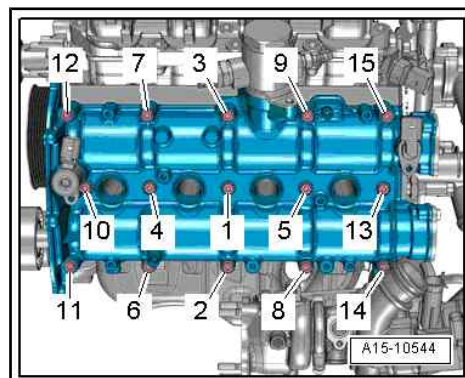
Cylinder head - tightening torque and tightening order

– Tighten screws in the specified stages in the given sequence:

Stage	Screws	Tightening torque/torquing angle
1.	-1-...-10-	30 Nm
2.	-1-...-10-	90°
3.	-1-...-10-	90°
4.	-1-...-10-	90°



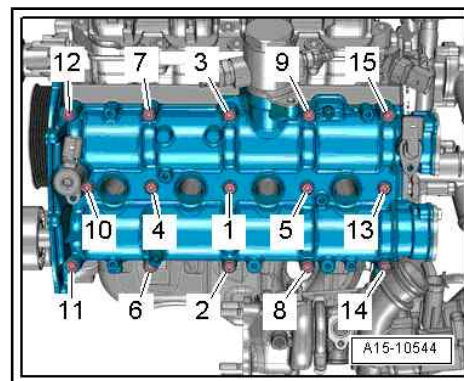
Camshaft housing - loosening sequence



Camshaft housing - tightening torque and tightening order

– Tighten screws in the specified stages in the given sequence:

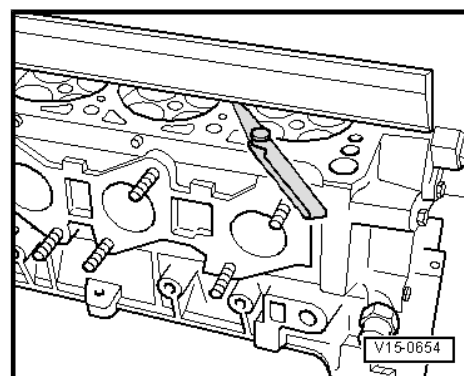
Stage	Screws	Tightening torque/torquing angle
1.	-1-...-15-	10 Nm
2.	-1-...-15-	90°



Inspecting the cylinder head for distortion

Check with straightedge 500 mm , e. g. -VAS 6075- and feeler gauge.

- Max. permissible distortion: 0.05 mm



1.2 Removing and installing the cylinder head

Special tools and workshop equipment required

- ◆ Support bracket - T30099- (Octavia II, Yeti and Rapid NH)
- ◆ Base - T30099/1- (Octavia II, Yeti and Rapid NH)
- ◆ Support bracket - MP 9-200 (10-222A)- (Superb II)
- ◆ Wing plates - T10311- (Superb II)
- ◆ Support - T10358-
- ◆ Hook - MP 9-200/10-
- ◆ Sealant remover gasket stripper (bearing code GST, bearing article no. R 34402), manufacturer Retech s.r.o.

Removing

Observe safety instructions ⇒ [“2 Safety instructions”, page 3](#) .

Observe rules for cleanliness
⇒ [“3.1 Rules of cleanliness”, page 8](#) .

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Relieve pressure in the high pressure system
⇒ [“1.2 Reduce fuel pressure”, page 269](#) .

- Drain the coolant from the cooling system and the charge air cooling system
⇒ [“1.3 Draining and filling coolant”, page 155](#) .
- Remove engine cover
⇒ [“3.1 Removing and installing engine trim panel”, page 48](#) .

- Remove coolant regulator housing from the cylinder head
⇒ [“2.2 Assembly overview - thermostat”, page 161](#) .
- Removing the intake manifold
⇒ [“4.2 Removing and installing intake manifold”, page 281](#) .
- Remove exhaust turbocharger
⇒ [“1.2.1 Removing and installing the exhaust gas turbocharger with exhaust manifold”, page 238](#) .

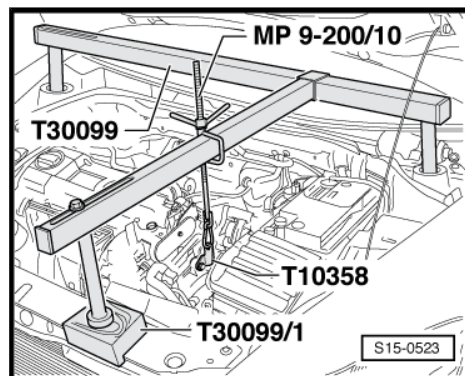
For vehicles Octavia II, Yeti and Rapid NH

- Position support bracket - T30099- with base - T30099/1- as shown.
- Unscrew the fixing screw for the gearbox and screw down the bracket - T10358- .
- Support engine in installation position using hook - MP 9-200/10- and tension slightly.



Note

The timing case is removed when the engine is suspended with the bracket - T10358- .



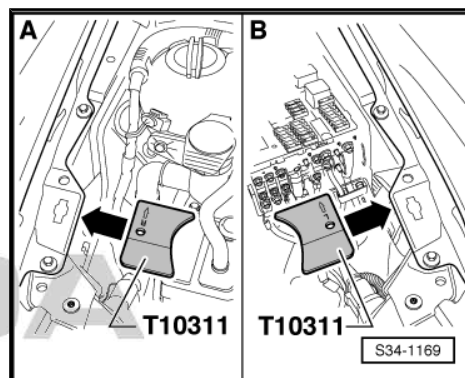
For vehicles Superb II

- Remove the front stop buffers for the front flap from both upper edges of the wings.
- Insert the wing plate - T10311- on the right vehicle side -A- in -the direction of the arrow- up to the stop. When doing this, the -arrow R- on the wing plate - T10311- points to the rear.
- Also insert the wing plate - T10311- on the left vehicle side -B- in -the direction of the arrow- up to the stop. When doing this, the -arrow L- on the wing plate - T10311- points to the rear.



Note

The wing plates - T10311- ensure that the wings do not get damaged through the weight of the engine/gearbox unit.

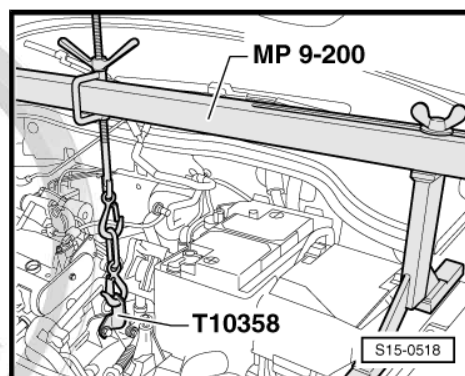


- Fit support bracket - MP 9-200- .
- Unscrew the fixing screw for the gearbox and screw down the bracket - T10358- .
- Support engine in installation position using hook - MP 9-200/10- and tension slightly.



Note

The timing case is removed when the engine is suspended with the bracket - T10358- .



Continued for all vehicles

- Remove timing case
⇒ [“2.1 Removing and installing the timing case”, page 97](#) .
- Remove the timing chain from the camshaft sprockets
⇒ [“3.2 Removing and installing timing chain and drive chain for oil pump”, page 108](#) .

- Remove the tensioning rail -1- and the sliding rail -2- from the bearing bolts.
- Remove camshaft housing
⇒ [“1.3 Removing and installing camshaft housing”](#),
[page 88](#) .
- Remove the roller rocker arm together with the supporting elements and lay aside on a clean surface.
- Ensure that the roller rocker arms and the balancing elements are not mixed up.
- Loosen the cylinder head bolts in the specified sequence and remove
⇒ [Fig. “Cylinder head - loosening sequence”](#) , [page 84](#) .
- Carefully remove the cylinder head.

Install

Precondition

- The pistons must not be positioned at top dead centre.



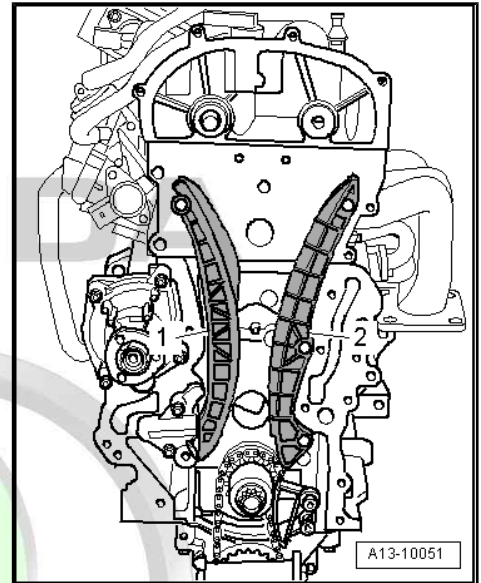
Note

- ◆ *Replace cylinder head bolts.*
 - ◆ *When performing installation work replace the self-locking nuts.*
 - ◆ *Replace screws which have been tightened firmly to a torquing angle.*
 - ◆ *If an exchange cylinder head is installed, all the contact surfaces between the supporting elements, roller rocker fingers and the cam tracks must be oiled before the assembly of the cylinder head cover.*
 - ◆ *Do not remove new cylinder head gasket from packaging until it is ready to be fitted.*
 - ◆ *Treat the new seal with the utmost care. Damage will cause leakage.*
 - ◆ *There must be no oil or coolant in the blind holes of the cylinder head bolts in the cylinder block.*
- Stuff clean cloth into the cylinders to avoid any dirt getting in between cylinder wall and piston.



WARNING

Wear protective gloves when working with sealant and grease remover!



- Make sure that when cleaning the cylinder head and cylinder block no foreign bodies can get into the cylinder or into the oil and coolant galleries.
- Carefully remove old sealant residue from the cylinder head and cylinder block using a chemical sealant remover.
- Position piston of cylinder 1 to top dead centre and slightly turn the crankshaft anticlockwise again.
- Position the new cylinder heads. The text (part number) must be visible.



- Insert the cylinder head. Pay attention to the dowel pins in the cylinder block.
- Screw in new cylinder head bolts and tighten by hand.
- Tighten cylinder head bolts in the specified stages in the given sequence
⇒ [Fig. "Cylinder head - tightening torque and tightening order", page 84](#).
- Insert the hydraulic balancing elements in the cylinder head and position the relevant roller rocker arms on the valve stem ends and balancing elements.
- Install camshaft housing
⇒ ["1.3 Removing and installing camshaft housing", page 88](#).

Further installation occurs in reverse order for removal, while paying attention to the following:

- Top up and bleed cooling system
⇒ ["1.3 Draining and filling coolant", page 155](#).

Tightening torques

- ◆ ⇒ ["3.1 Removing and installing engine trim panel", page 48](#)
- ◆ ⇒ ["2.2 Assembly overview - thermostat", page 161](#)
- ◆ ⇒ ["4.1.2 Summary of components - intake manifold part II", page 280](#)
- ◆ ⇒ ["1.1 Summary of components - exhaust gas turbocharger", page 235](#)
- ◆ ⇒ ["3.1 Summary of components - timing chain", page 105](#)
- ◆ ⇒ ["1.1 Summary of components - cylinder head", page 81](#)

1.3 Removing and installing camshaft housing

Special tools and workshop equipment required

- ◆ Sealant ⇒ ETKA - Electronic Catalogue of Original Parts
- ◆ Two stud screws (M6 x 80)
- ◆ Camshaft clamp - T10171A-

Converting camshaft clamp - T10171- to -T10171A-
⇒ [page 108](#).

- ◆ Sealant remover gasket stripper (bearing code GST, bearing article no. R 34402), manufacturer Retech s.r.o.
- ◆ Cleaning and degreasing agent , e.g. -D 009 401 04-

Removing



Note

- ◆ *On this engine the camshafts are located in the camshaft housing. Before removing the camshaft housing, the timing case must be removed*
⇒ ["2.1 Removing and installing the timing case", page 97](#).
- ◆ *Do not rework the sealing surface of the camshaft housing.*

Observe safety instructions ⇒ ["2 Safety instructions", page 3](#).

Observe rules for cleanliness

⇒ "3.1 Rules of cleanliness", page 8 .



WARNING

*Relieve pressure in the high pressure system
⇒ "1.2 Reduce fuel pressure", page 269 .*

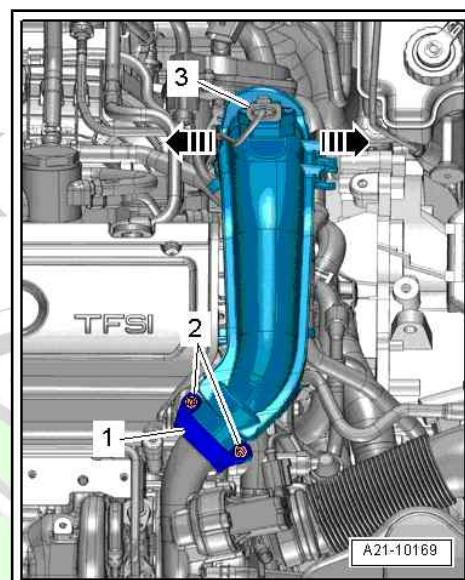
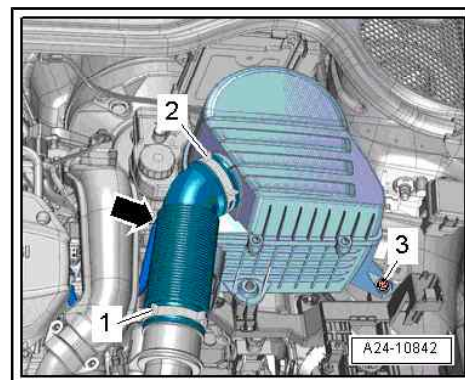
- Remove engine cover
⇒ "3.1 Removing and installing engine trim panel", page 48 .

For Rapid NH vehicles

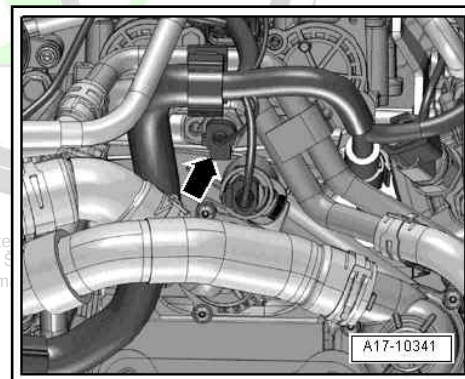
- Detach the vacuum hose -arrow- from the brake servo unit.
- Loosen hose clamps -1- and -2- and remove air guide pipe.

Continued for all vehicles

- Unscrew screws -2- and remove retaining bracket -1-.
- Disconnect plug -3- at charge pressure sender - G31- with intake air temperature sender 2 - G299- .
- Expose hoses at the air guide pipe.
- Unlock catches -arrows- and air guide pipe first from the throttle valve control unit - J338- , then from the exhaust gas turbocharger.



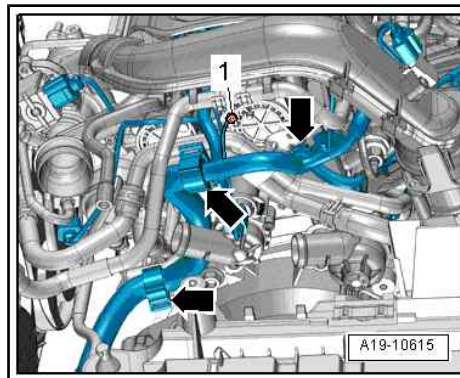
- Disconnect electrical plug connection -arrow- at the oil pressure switch - F1- .



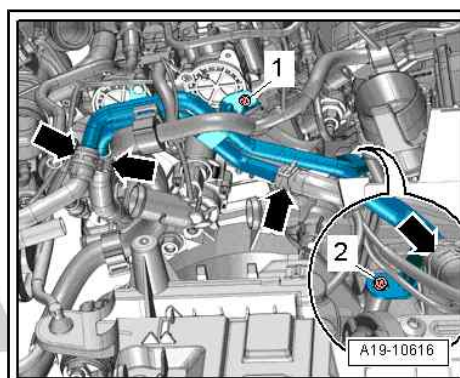
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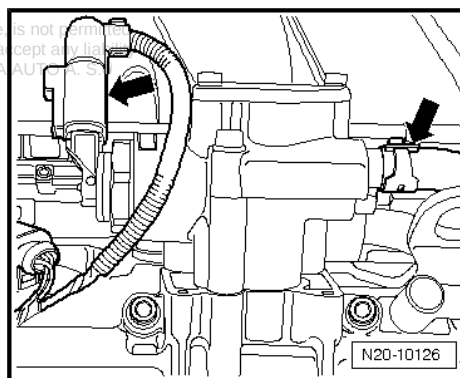
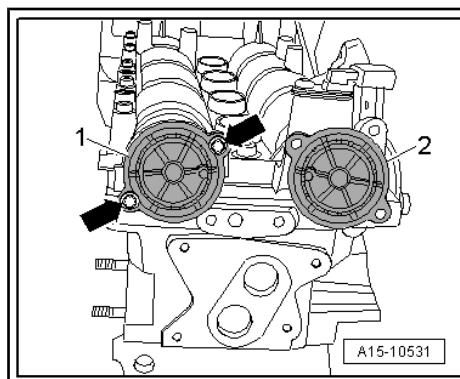
- Unscrew earth cable screw -1-.



- Unscrew screws -1- and -2- and push left coolant pipe aside to the left.



- Screw out the screws -arrows-, remove cap -1- and -2-.
- Remove exhaust turbocharger
⇒ [“1.2.1 Removing and installing the exhaust gas turbocharger with exhaust manifold”, page 238](#) .
- Remove timing case
⇒ [“2.1 Removing and installing the timing case”, page 97](#) .
- Turn the crankshaft to TDC for cylinder 1, then turn back the crankshaft approx. 45° in the opposite direction of rotation of the engine and remove the camshaft chain sprockets with the timing chain ⇒ [“3.4 Adjusting valve timing”, page 119](#) .
- Disconnect the plug from the high pressure pump.
- Removing ignition coils
⇒ [“1.2 Removing and installing ignition coils with output stage”, page 315](#) .
- Remove cable guide with wiring loom from camshaft housing.
- Detach the fuel feed line -arrow right- from the high pressure pump.

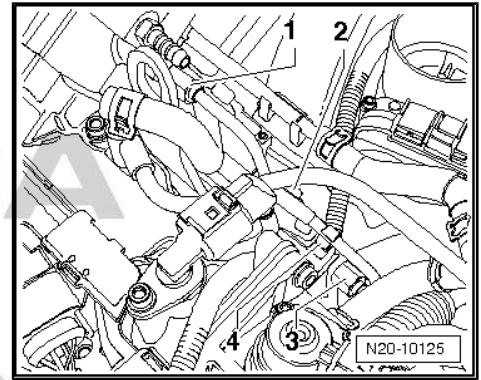


- Disconnect the wiring -2- and remove the clip -4- from the high pressure line.

i Note

Hold the screwed connections at the high pressure pump and at the bottom part of intake manifold/fuel distributor when loosening the union nuts with a wrench.

- Slacken the union nuts -3- and -1- at the high pressure line.
- Disconnect the plug from the Hall sender - G40- .
- Pull out oil dipstick.
- Unscrew left lifting eye.
- Loosen the screws for camshaft housing in the specified sequence and remove
⇒ Fig. “Camshaft housing - loosening sequence” , page 84 .
- Carefully remove the camshaft housing.



Install



Caution

Before installing the camshaft housing, screw in the stud screws (M 6 x 80) at the cylinder head.

The stud screws guide the camshaft housing and prevent the roller rocker arms sliding off from the supporting elements.

Precondition

- The pistons must not be positioned at top dead centre.



WARNING

Wear protective gloves when working with sealant and grease remover!

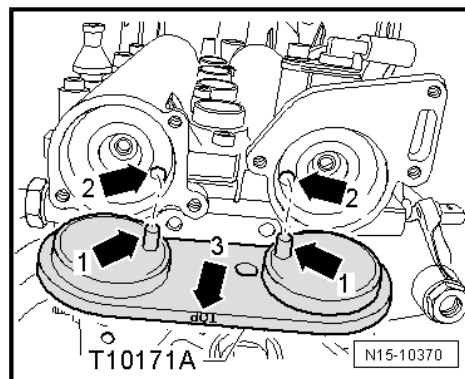
- Remove residual sealant on the cylinder head and camshaft housing using a chemical sealant remover.
- Degrease the sealing surfaces. They must be free of oil and grease.
- Ensure that no dirt and sealant residues get into the cylinder head.



Caution

- ◆ *Before fitting on the camshaft fixer/locator - T10171A- , it is essential to check whether the tensioning sleeves protrude at least 7 mm.*
- ◆ *If this is not the case, then the camshaft fixer/locator is defective and must be replaced.*
- ◆ *The camshaft fixer/locator must not be inserted using force or for example with blows of a hammer.*

- Turn the inlet and exhaust camshaft until the camshaft fixer/locator - T10171A- can be inserted up to the stop into the camshaft openings.

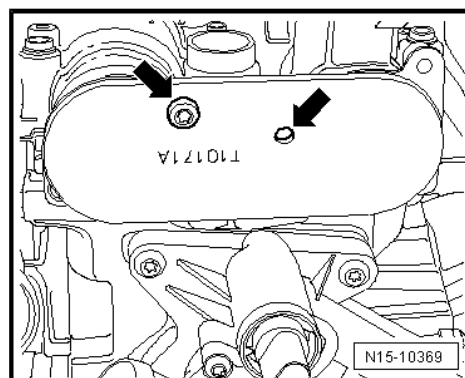


- To secure the camshaft fixer/locator - T10171A- screw in a M6 screw into the corresponding hole -arrows- by hand; do not tighten.

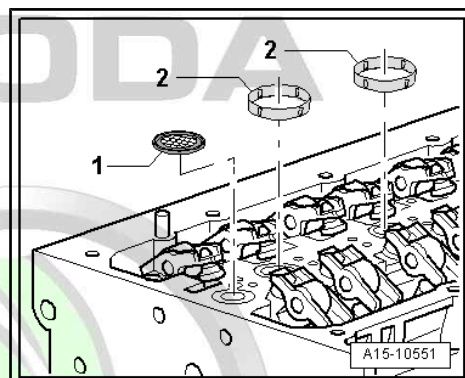


Note

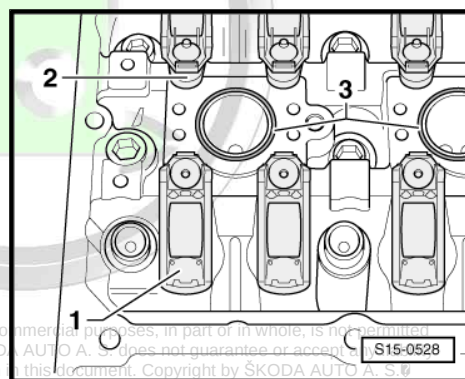
Pay attention that there are different fixing points for the camshaft fixer/locator - T10171A- .



- Replace oil strainer -1- and insert in the cylinder head.
- Insert 4 new gasket rings -2- into the grooves of the cylinder head.



- Ensure that all the roller arms are correctly positioned on the valve stem ends -1- and are clipped in place on the relevant hydraulic supporting elements -2-.



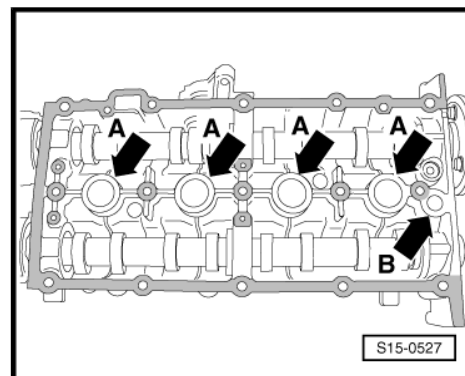
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- Apply a thin coating of sealant ⇒ ETKA Electronic Catalogue of Original Parts uniformly on the clean sealing surface of the camshaft housing (see grid surfaces in the illustration).
- Do not apply sealant in the area of the -arrows A-. Here the cylinder head is sealed with the inserted gasket rings.



Note

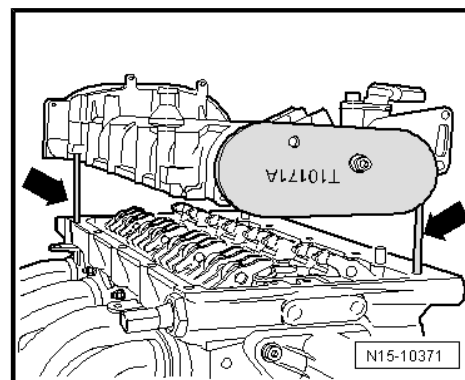
- ◆ No sealant must be applied in the area -arrow B-. Here the oil strainer seals.
- ◆ The sealant must not be applied too thickly, as otherwise excess sealant may penetrate into the oil bores and may cause engine damage.
- Screw in two stud screws (M6 x 80) into the cylinder head before fitting on the camshaft housing.
- Carefully place the camshaft housing vertically from above onto the stud screws -arrows- and dowel pins of the cylinder head.



Note

Make sure that no residues of oil drop down onto the sealing flange and the camshaft housing does not tilt.

- Tighten screws for camshaft housing in the specified stages in the given sequence
⇒ [Fig. "Camshaft housing - tightening torque and tightening order"](#), page 85 .



Note

- ◆ Make sure that the camshaft housing does not tilt.
- ◆ After installing the camshaft housing, allow the sealant to dry for about 30 minutes.
- Set the timing ⇒ ["3.4 Adjusting valve timing"](#), page 119 .

Installation is carried out in the reverse order. When installing, observe the following:

- Install timing case
⇒ ["2.1 Removing and installing the timing case"](#), page 97 .
- Install exhaust turbocharger
⇒ ["1.2.1 Removing and installing the exhaust gas turbocharger with exhaust manifold"](#), page 238 .
- Connect fuel lines
⇒ ["7.1 Summary of components - high pressure pump"](#), page 297 .

Tightening torques

- ◆ ⇒ ["3.1 Removing and installing engine trim panel"](#), page 48
- ◆ ⇒ ["1.1 Summary of components - exhaust gas turbocharger"](#), page 235
- ◆ ⇒ ["3.1 Summary of components - timing chain"](#), page 105
- ◆ ⇒ ["1.1 Summary of components - cylinder head"](#), page 81



1.4 Testing the compression

Special tools and workshop equipment required

- ♦ Spark plug wrench , e.g. -3122 B-
- ♦ Compression tester - V.A.G 1763-
- Engine oil temperature at least 30 °C.
- Battery voltage at least 12.5 V.

Test sequence

- Remove fuse for fuel pump control unit from the fuse holder.
Fuse assignment ⇒ Current flow diagrams, Electrical fault finding and Fitting locations



Note

Removing fuse interrupts the voltage supply of the fuel pump control unit.

- Start engine and allow to run until the engine has cut out.
- Switch off ignition.
- Remove engine cover
⇒ ["3.1 Removing and installing engine trim panel", page 48](#) .
- Remove ignition coils with power output stage
⇒ ["1.2 Removing and installing ignition coils with output stage", page 315](#) .
- Pull out spark plugs with spark plug socket wrench , e. g. -3122 B- .

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- Check the compression pressure using the compression tester - V.A.G 1763- ; handling, ⇒ Operating Manual .
- 2nd mechanic depresses the accelerator pedal fully and at the same time actuates the starter until the tester shows no further pressure rise.
- Repeat the work procedure for each cylinder.

Compression readings	
New part	1,0 ... 1,5 MPa (10,0...15,0 bar)
Wear limit	0,7 MPa (7,0 bar)
Maximum difference between cylinders	0,3 MPa (3,0 bar)

If the specified values are not reached, test the combustion chamber for tightness

⇒ [“1.5 Checking the combustion chamber for tightness”, page 95](#) .

Install

The further assembly is carried out in reverse order to disassembly. Pay attention to the following:

- Install ignition coils at power output stage
⇒ [“1.2 Removing and installing ignition coils with output stage”, page 315](#) .

Because the electrical plug connections were disconnected and the engine started, faults are stored in the event memory of the engine control unit.

- Clear event memory and re-generate the readiness code ⇒ Vehicle diagnostic tester

Tightening torques

- ◆ ⇒ [“3.1 Removing and installing engine trim panel”, page 48](#)
- ◆ ⇒ [“1.1 Assembly overview - ignition system”, page 314](#)

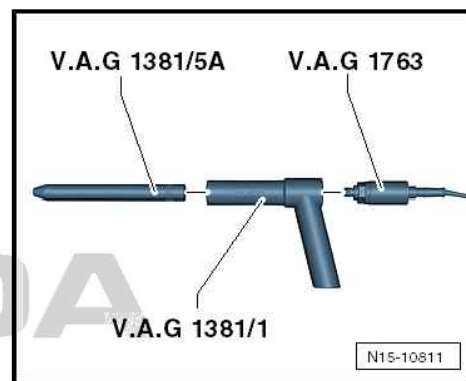
1.5 Checking the combustion chamber for tightness

Special tools and workshop equipment required

- ◆ Pressure hose - MP 1-210 (VW 653/3)- (replace sealing ring with a spark plug sealing ring)
- ◆ Spark plug wrench , e.g. -3122 B-

Test sequence

- Pull out spark plugs with spark plug socket wrench , e. g. -3122 B- .
- Position piston of the relevant cylinder to dead centre.
- Screw the pressure hose in the spark plug thread.
- Connect pressure hose to compressed air.
- With the assistance of a second mechanic, lock the screw at the crankshaft on TDC position in order to avoid displacement of the piston after pressure build-up.
- Build up a pressure of approx. 0,3 MPa (3 bar) in the combustion chamber.
- Determine how the pressure escapes:





- 1 - Via the inlet valve(s) - the pressure enters the intake manifold.
- 2 - Via the outlet valve(s) - the pressure enters the exhaust system.
- 3 - Via the piston rings - the pressure enters the cylinder block.

Tightening torques

⇒ ["1.1 Assembly overview - ignition system", page 314](#)

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2 Cover for timing chain

⇒ [“2.1 Removing and installing the timing case”, page 97](#)

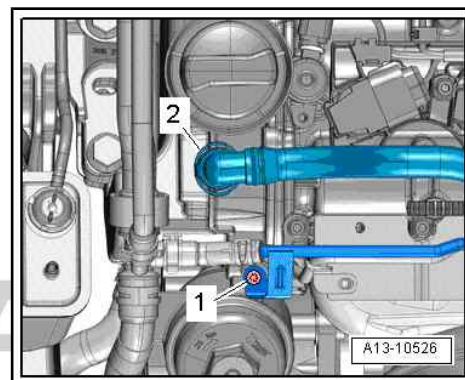
2.1 Removing and installing the timing case

Special tools and workshop equipment required

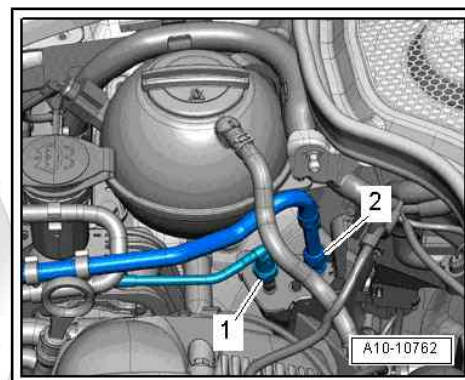
- ◆ Support bracket - T30099- (Octavia II, Yeti and Rapid NH)
- ◆ Base - T30099/1- (Octavia II, Yeti and Rapid NH)
- ◆ Support bracket - MP 9-200 (10-222A)- (Superb II)
- ◆ Wing plates - T10311- (Superb II)
- ◆ Hook - MP 9-200/10-
- ◆ Counterholder - T30004 (3415)-
- ◆ Bolt - T30004/1 (3415/1)-
- ◆ Sealant ⇒ ETKA - Electronic Catalogue of Original Parts
- ◆ Sealant remover gasket stripper (bearing code GST, bearing article no. R 34402), manufacturer Retech s.r.o.
- ◆ Cleaning and degreasing agent , e.g. -D 009 401 04-

Removing

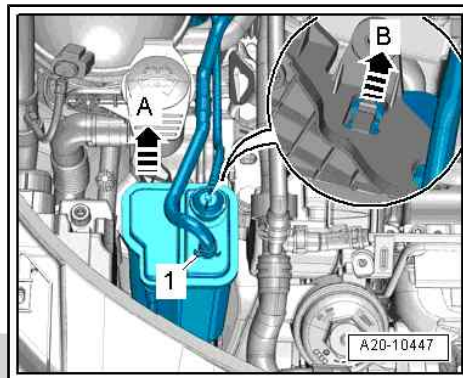
- Remove engine cover
⇒ [“3.1 Removing and installing engine trim panel”, page 48](#) .
- Release screw -1- of coolant line.
- Remove crankcase ventilation hose -2- from the timing chain cover by pressing the circlip inwards.



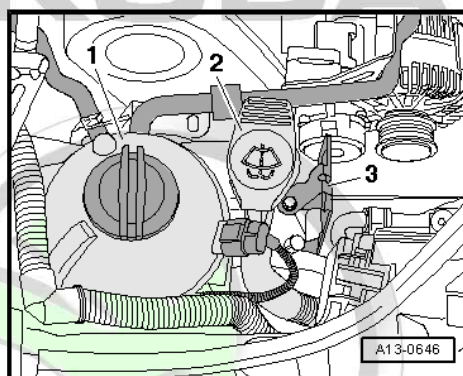
- Disconnect vent line -1-. To do so press in the securing ring.



- Detach the bleeder hose -1- to intake manifold at the activated charcoal filter.
- Unlock activated charcoal filter -arrow B- and remove the activated charcoal filter upwards -arrow A-.



- Unscrew bracket -3- for activated charcoal filter.
- Unscrew screw on windshield washer fluid reservoir filler neck -2-.
- Remove plug from the coolant shortage indicator switch - F66- at the coolant expansion tank and expose electrical wiring loom.
- Unscrew coolant expansion tank screws -1-; place coolant expansion tank with connected hoses on the engine and attach if necessary.
- Remove V-ribbed belt
⇒ [“1.3 Removing and installing V-ribbed belt”, page 54](#) .
- Remove belt pulley from the coolant pump
⇒ [“2.5 Removing and installing belt pulley for coolant pump”, page 163](#) .



Vehicles with air conditioning



WARNING

Risk of injury through refrigerant.

- ◆ ***Do not open the refrigerant circuit of the air conditioning system.***

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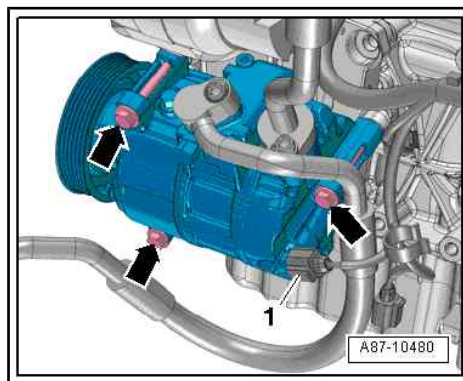
- Disconnect electric plug connection -1- on the control valve for the air conditioning system - N280- compressor.
- Release screws -arrows- for AC compressor.



Caution

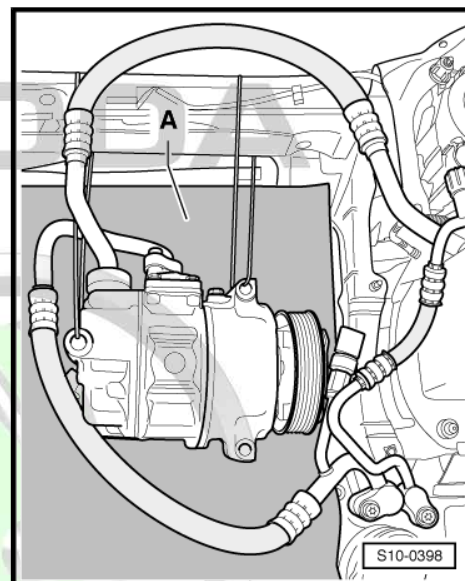
Risk of damaging AC compressor, refrigerant lines and hoses.

- ◆ ***Do not over-tension, buckle or bend refrigerant lines and hoses.***

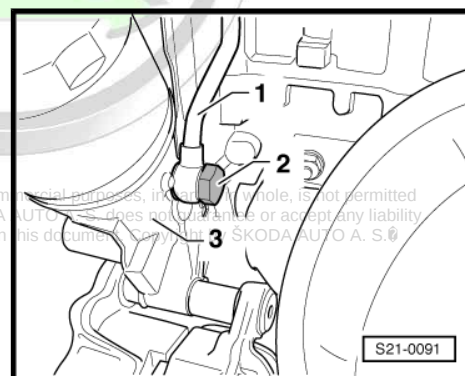


- Secure AC compressor to the lock carrier with connected hoses. Insert a sheet of cardboard -A- when doing so to protect the radiator.
- Remove the generator support bracket
⇒ ["1.5 Removing and installing bracket for auxiliary units", page 59](#)

Continued for all vehicles



- Unscrew the hollow screw -2- of the oil feed line -1- for the exhaust gas turbocharger out of the timing case -3-.



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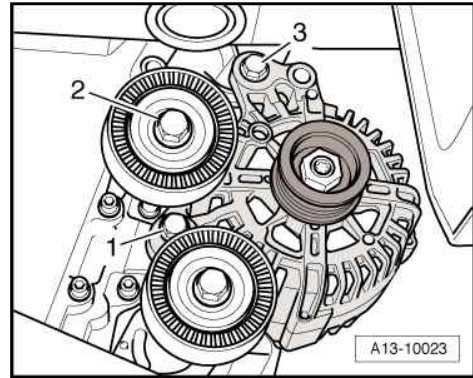
- Remove alternator ➔ Electrical System; Rep. gr. 27 .
- Remove guide pulley -2-.
- Rotate the crankshaft in direction of rotation of engine on TDC for cylinder 1 ➔ [“3.3 Checking valve timing”, page 116](#) .
- Remove crankshaft toothed belt sprocket
➔ [“1.4 Removing and installing ribbed belt pulley”, page 55](#) .



Caution

Risk of engine damage.

- ◆ *In order to avoid that the chain sprocket on the crankshaft slides out of the driver, the crankshaft must not be turned when the V-ribbed belt pulley is released.*



- Removing the oil pan
➔ [“1.3 Removing and installing oil pan”, page 140](#) .

For vehicles Octavia II, Yeti and Rapid NH



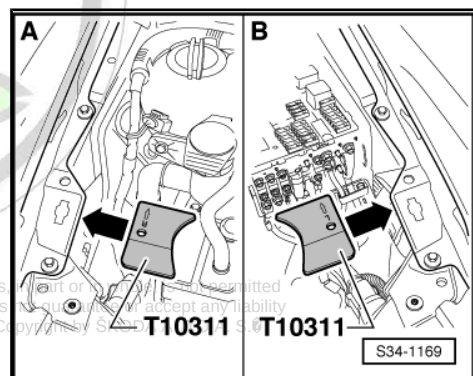
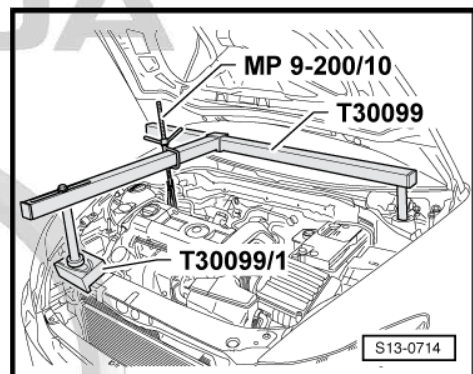
Note

If the timing case is only removed for the purpose of removing the cylinder head, the engine bracket described below is not carried out. The cylinder head mounting procedure described is used instead.

- Attach the hook - MP 9-200/10 - to the support bracket - T30099- , as shown in the figure.
- Position support bracket - T30099- with base - T30099/1- and suspend hook of spindle in the lifting eye.
- Pre-tension the engine slightly.

For vehicles Superb II

- Remove the front stop buffers for the front flap from both upper edges of the wings.
- Insert the wing plate - T10311- on the right vehicle side -A- in -the direction of the arrow- up to the stop. When doing this, the -arrow R- on the wing plate - T10311- points to the rear.
- Also insert the wing plate - T10311- on the left vehicle side -B- in -the direction of the arrow- up to the stop. When doing this, the -arrow L- on the wing plate - T10311- points to the rear.

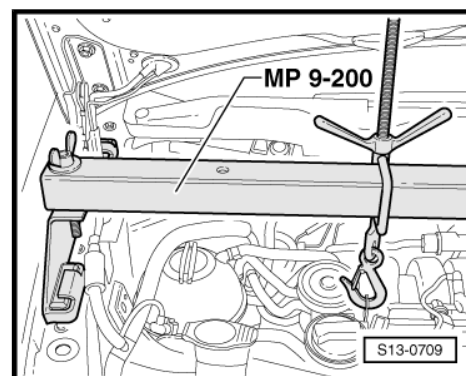


Note

The wing plates - T10311- ensure that the wings do not get damaged through the weight of the engine/gearbox unit.

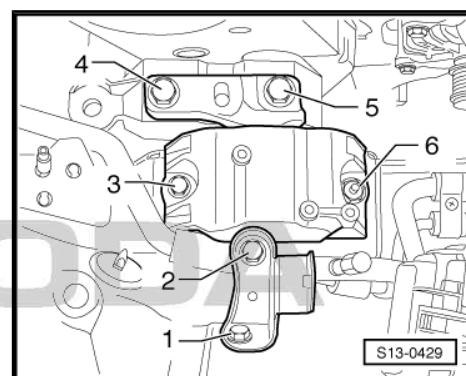
- Position support bracket - MP 9-200- and hook spindle into the lifting eye.
- Pre-tension the engine.

For vehicles Octavia II, Yeti and Superb II



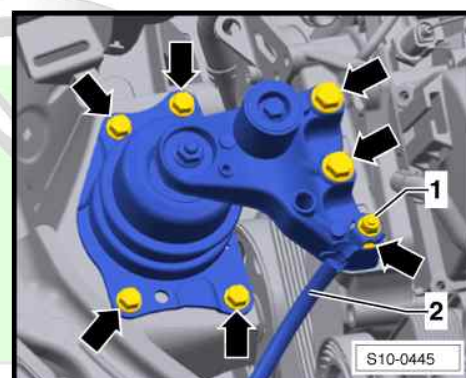
- Unscrew screws -1- to -6- and remove engine mount.

For vehicles Rapid NH



- Unscrew nut -1- and remove earth cable.
- Screw out screws -arrows- and remove engine mount.

Continued for all vehicles



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- Unscrew the Allen screws -1- to -6- of the timing case and the screws marked with the -arrows-.
- Remove timing case. To do so if necessary slightly raise engine.



Note

Make sure that the bushing for the crankshaft remains in the timing case.

- Drive gasket ring for crankshaft out of the timing case.

Install



Note

Observe that the clamping surfaces of the belt pulley, the fixing screw, the bushing and the crankshaft chain sprocket are free of oil and grease.

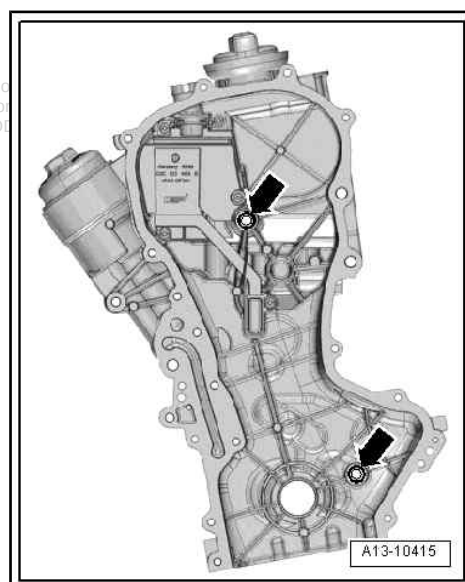
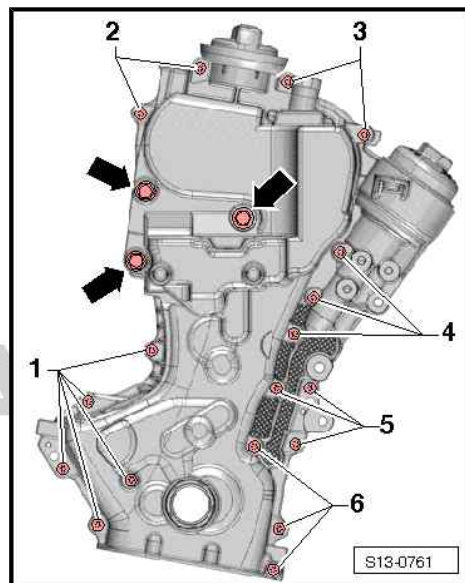


WARNING

Wear protective gloves when working with sealant and grease remover!

- Remove residual sealant on the sealing surfaces with chemical sealant remover.
- Degrease the sealing surfaces.
- Insert new gasket rings -arrows- onto the reverse side of the timing case.

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Note

- ◆ Furthermore, the timing case is sealed to the engine with a seal and additionally with the sealant ⇒ ETKA - Electronic Catalogue of Original Parts .
- ◆ The sealant ⇒ ETKA - Electronic Catalogue of Original Parts is used to prevent leaks between the timing case and joints -1- and -2-.
- ◆ The sealant points must have a diameter of 10 mm and must be approx. 1 mm thick.
- ◆ Only apply the sealant immediately before installing the timing case.

– Apply sealant ⇒ ETKA - Electronic Catalogue of Original Parts to the camshaft housing/cylinder head-1- joints and the cylinder head/cylinder block joints -2-.

– Carefully place the new gasket onto the dowel pins.

– For better guidance, screw two stud screws -M6 x 80- into the cylinder head and the cylinder block.

– Simultaneously place the timing case with crankshaft bushing on the stud bolts, dowel pins and crankshaft studs.

– Tighten diagonally and evenly the fixing screws of the timing case.

Make sure that the timing case does not tilt.

– Install engine mount:

◆ Octavia II, Superb II and Yeti
⇒ [“2.2.1 Removing and installing engine mount \(Octavia II, Superb II and Yeti\)”, page 37](#) .

◆ Rapid NH
⇒ [“2.2.2 Removing and installing the engine mount \(Rapid NH\)”, page 39](#) .

For vehicles Octavia II, Superb II, Yeti

– Adjust the assembly bracket
⇒ [“2.6 Adjusting the unit mounting”, page 45](#) .

Continued for all vehicles

– Install the gasket ring for the crankshaft on the belt pulley side
⇒ [“1.6 Replacing crankshaft seal on belt pulley side”, page 60](#) .

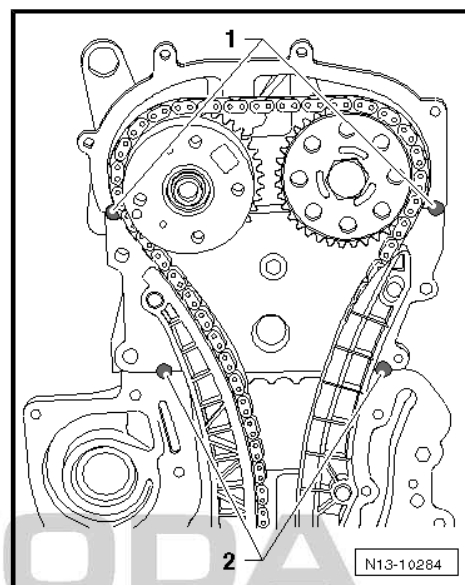
– Install the vibration damper
⇒ [“1.4 Removing and installing ribbed belt pulley”, page 55](#) .

– Attach the oil feed line for the exhaust gas turbocharger to the timing case
⇒ [“1.1 Summary of components - exhaust gas turbocharger”, page 235](#) .

Further installation occurs in a similar way in reverse order to removal.

Tightening torques

- ◆ ⇒ [“3.1 Removing and installing engine trim panel”, page 48](#)
- ◆ ⇒ [“2.1.1 Summary of components - assembly bracket \(Octavia II, Superb II and Yeti\)”, page 34](#)
- ◆ ⇒ [“2.1.2 Summary of components - assembly bracket \(Rapid NH\)”, page 36](#)



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- ◆ ⇒ ["1.1 Assembly overview - poly V-belt drive", page 49](#)
- ◆ ⇒ ["3.1 Summary of components - timing chain", page 105](#)
- ◆ AC compressor ⇒ Heating, Air Conditioning; Rep. gr. 87
- ◆ Screw for AC generator ⇒ Electrical System; Rep. gr. 27

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3 Chain drive

⇒ [“3.1 Summary of components - timing chain”, page 105](#)

⇒ [“3.2 Removing and installing timing chain and drive chain for oil pump”, page 108](#)

⇒ [“3.3 Checking valve timing”, page 116](#)

⇒ [“3.4 Adjusting valve timing”, page 119](#)

3.1 Summary of components - timing chain



Note

- ◆ *Before assembly, oil all bearing and contact surfaces.*
- ◆ *If considerable quantities of metal swarf or abrasion is found when carrying out engine repairs, this can be subject to damage to the crankshaft and conrod bearings. In order to avoid consequential damage, after the repair perform the following tasks:*
 - Carefully clean the oil galleries.
 - Replace oil spray jets.
 - Replace engine oil cooler.
 - Replace oil filter.

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1 - Cylinder head with cylinder head cover

- ☐ removing and installing
⇒ ["1.2 Removing and installing the cylinder head", page 85](#)
- ☐ Do not rework the sealing surface
- ☐ Cylinder head housing with integrated camshaft bearings

2 - Cylinder block

- ☐ Sealing flanges and fly-wheel
⇒ ["2.1 Assembly overview - cylinder block, gearbox end", page 62](#)
- ☐ Pistons and conrods
⇒ ["4.1 Assembly overview - piston and conrod", page 76](#)
- ☐ inspect cylinder bore
⇒ [Fig. "Inspecting cylinder bore", page 79](#)

3 - Bracket for auxiliary units

- ☐ for tensioning device and AC compressor
- ☐ removing and installing
⇒ ["1.5 Removing and installing bracket for auxiliary units", page 59](#)

4 - Cover

5 - Sprocket

- ☐ for oil pump drive and timing chain
- ☐ Clamping surfaces must be free of oil and grease.

6 - Screw

- ☐ Replace after disassembly
- ☐ 20 Nm + 90°

7 - Sprocket

- ☐ Counterhold sprocket with counterholder - T10172-

8 - Chain

- ☐ mark running direction (installed position) before removing

9 - Screw

- ☐ Tightening torque ⇒ ["1.2 Assembly overview - cylinder block \(pulley end\)", page 51](#)

10 - Carrier bolt for tensioning device

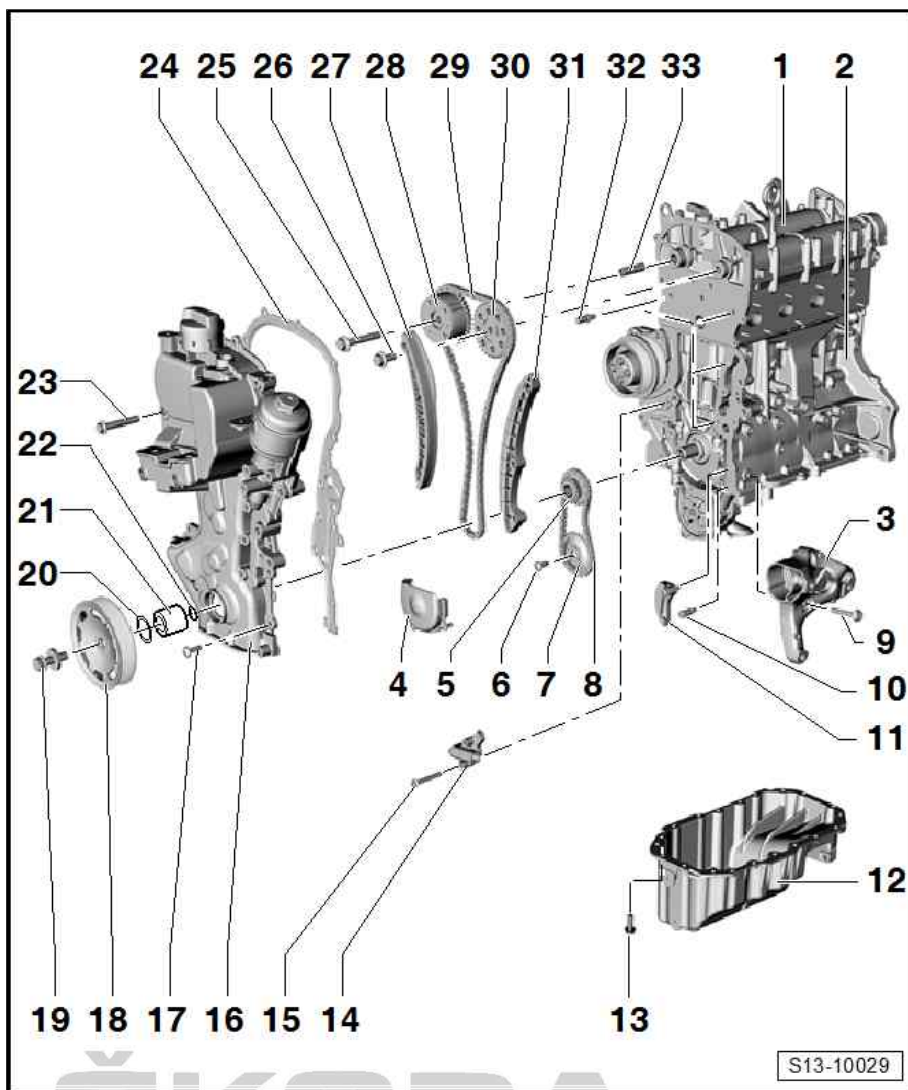
- ☐ 8 Nm

11 - Chain tensioner with tensioning rail

- ☐ for oil pump drive

12 - Oil pan

- ☐ removing and installing ⇒ ["1.3 Removing and installing oil pan", page 140](#)
- ☐ clean sealing surface before installing
- ☐ Install with silicone sealant ⇒ ETKA - Electronic Catalogue of Original Parts





13 - Screw

- ☐ Replace after disassembly
- ☐ Tightening torque ⇒ [“1.1 Assembly overview - sump/oil pump”, page 137](#)

14 - Chain tensioner

15 - Screw

- ☐ 9 Nm

16 - Timing case

- ☐ removing and installing ⇒ [“2.1 Removing and installing the timing case”, page 97](#)
- ☐ Install with sealant ⇒ ETKA - Electronic Catalogue of Original Parts

17 - Screw

- ☐ 10 Nm

18 - Vibration damper

- ☐ removing and installing ⇒ [“1.4 Removing and installing ribbed belt pulley”, page 55](#)

19 - Fixing screw

- ☐ slacken and tighten ⇒ [“1.4 Removing and installing ribbed belt pulley”, page 55](#)
- ☐ Tightening torque ⇒ [“1.1 Assembly overview - poly V-belt drive”, page 49](#)

20 - Sealing ring

- ☐ replace after removal ⇒ [“1.6 Replacing crankshaft seal on belt pulley side”, page 60](#)

21 - Distance sleeve

22 - O-ring

- ☐ Replace after disassembly

23 - Screw

- ☐ 50 Nm

24 - Gasket

25 - Screw

- ☐ Replace after disassembly
- ☐ Counterhold camshaft adjuster with counterholder - T10172-
- ☐ Screw with left-hand thread
- ☐ First, tighten to the specified tightening torque.
- ☐ Tighten by 90° only after checking the valve timings
- ☐ 40 Nm + 90°

26 - Screw

- ☐ Replace after disassembly
- ☐ Counterhold sprocket with counterholder - T10172-
- ☐ First, tighten to the specified tightening torque.
- ☐ Tighten by 90° only after checking the valve timings
- ☐ 50 Nm + 90°

27 - Tensioning rail

28 - Camshaft adjuster

- ☐ for inlet valves
- ☐ must not be disassembled
- ☐ removing and installing
⇒ [“3.2 Removing and installing timing chain and drive chain for oil pump”, page 108](#)

29 - Timing chain

- ☐ removing and installing
⇒ [“3.2 Removing and installing timing chain and drive chain for oil pump”, page 108](#)
- ☐ Set the timing ⇒ [“3.4 Adjusting valve timing”, page 119](#) .



- ☐ Converting camshaft clamp - T10171- to -T10171A- ➔ [page 108](#)

30 - Sprocket

- ☐ for exhaust camshaft
☐ removing and installing
 ➔ ["3.2 Removing and installing timing chain and drive chain for oil pump", page 108](#)

31 - Sliding rail

- ☐ for timing chain

32 - Guide bolt

- ☐ 18 Nm

33 - Bearing bush

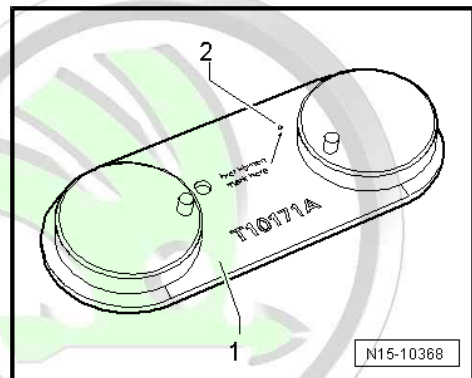
Converting camshaft clamp - T10171- to -T10171A-



Note

The fastening points for securing the camshaft clamp have changed. A new special tool called a camshaft clamp - T10171A- is used. The former camshaft clamp - T10171- can still be used if the work is carried out as described.

- Place template -1- on the camshaft clamp - T10171- as shown.
- Mark camshaft clamp - T10171- at marking -2- with a centre punch.
- Drill through the camshaft clamp - T10171- using a $\varnothing 7$ mm drill.
- Deburr bore on both sides
- Also mark tool designation "T10171" with an "A".



Note

- ◆ *The cylindrical pins of the camshaft clamp - T10171A- must not be shorter than 7 mm, otherwise there is a risk that the camshaft will not be locked in the correct position.*
- ◆ *Any tool that has positioning pins that are damaged or too short must not be used to adjust the valve gear and must be removed.*

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3.2 Removing and installing timing chain and drive chain for oil pump

Special tools and workshop equipment required

- ◆ Counterholder - T30004 (3415)-
- ◆ Adapter for dial gauge - T10170- or -T10170A-
- ◆ Camshaft clamp - T10171A-

Convert camshaft clamp - T10171- to camshaft clamp - T10171A-
 ➔ [page 108](#) .

- ◆ Counterholder - T10172-
- ◆ Rig pin - T40011-
- ◆ Dial gauge , e.g. -VAS 6079-

- ◆ Spark plug wrench , e.g. -3122 B- .

Removing

- Remove engine cover
⇒ [“3.1 Removing and installing engine trim panel”, page 48](#) .

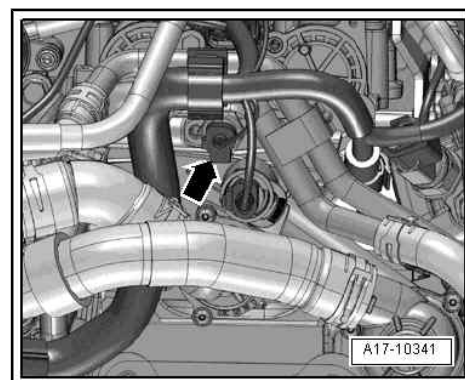
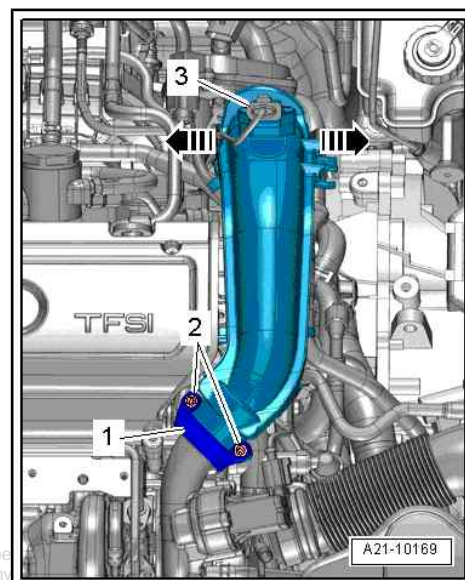
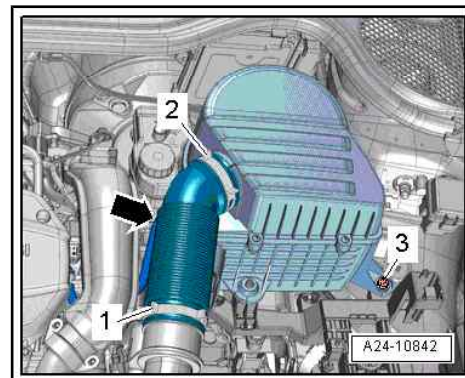
For Rapid NH vehicles

- Detach the vacuum hose -arrow- from the brake servo unit.
- Loosen hose clamps -1- and -2- and remove air guide pipe.

Continued for all vehicles

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- Unscrew screws -2- and remove retaining bracket -1-.
- Disconnect plug -3- at charge pressure sender - G31- with intake air temperature sender 2 - G299- .
- Expose hoses at the air guide pipe.
- Unlock catches -arrows- and air guide pipe first from the throttle valve control unit - J338- , then from the exhaust gas turbocharger.

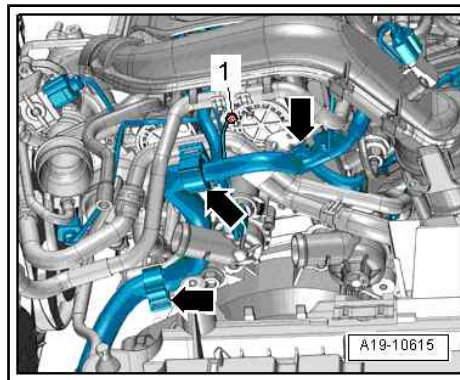


- Disconnect electrical plug connection -arrow- at the oil pressure switch - F1- .

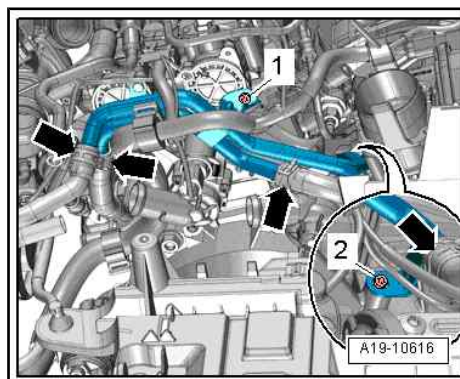
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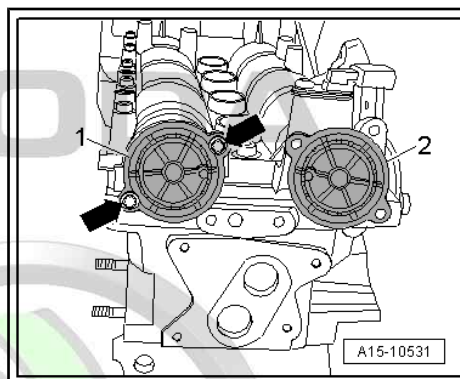
- Unscrew earth cable screw -1-.



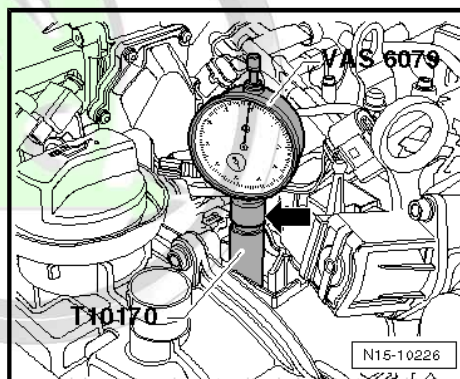
- Unscrew screws -1- and -2- and push left coolant pipe aside to the left.



- Screw out the screws -arrows-, remove cap -1- and -2-.
- Remove ignition coil for cylinder 1
⇒ [“1.2 Removing and installing ignition coils with output stage”](#),
[page 315](#).
- Pull out spark plug with spark plug wrench , e. g. -3122 B- .



- Screw adapter for dial gauge - T10170- up to the stop into the spark plug thread.
- Insert the dial gauge , e.g. -VAS 6079- with extension piece - T10170/1- up to stop and clamp firmly with the clamping screw -arrow-.
- Rotate the crankshaft in direction of rotation of engine on TDC for cylinder 1. Note down the position of the small pointer of the dial gauge.



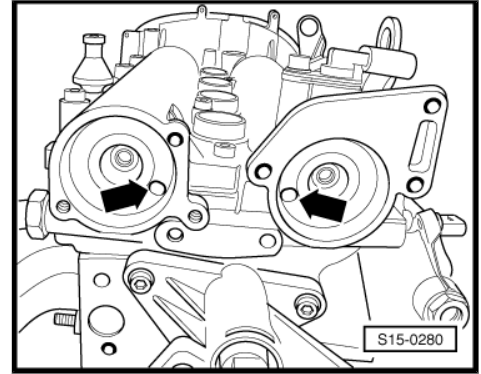
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The holes -arrows- in the camshafts must be positioned as shown. If necessary rotate the crankshaft a further revolution (360°).



Note

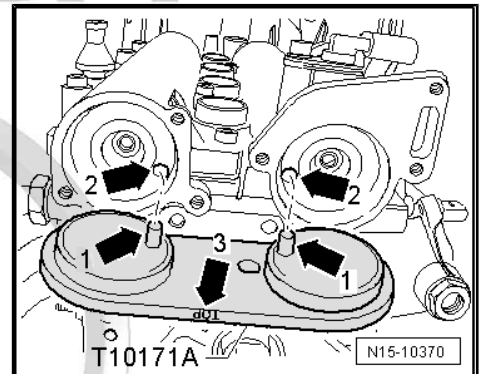
- ◆ If the crankshaft was turned more than 0.01 mm past the top dead centre, the crankshaft must once again be turned approx 45° in the opposite direction of rotation of the engine. Then position the crankshaft in direction of rotation of engine on top dead centre for cylinder 1.
- ◆ Permissible deviation from TDC for cylinder 1: ± 0.01 mm.



Caution

- ◆ Before fitting on the camshaft fixer/locator - T10171A-, it is essential to check whether the tensioning sleeves protrude at least 7 mm.
- ◆ If this is not the case, then the camshaft fixer/locator is defective and must be replaced.
- ◆ The camshaft fixer/locator must not be inserted using force or for example with blows of a hammer.

- Insert camshaft fixer/locator - T10171A- up to the stop into the holes in the camshaft housing.
- The locking bolts -arrows 1- must engage in the holes -arrows 2-. The inscription "TOP" -arrow 3- must be legible from above.



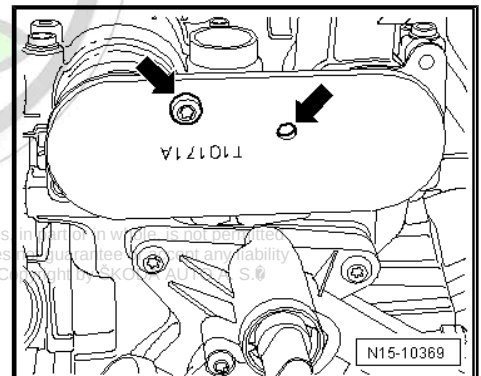
- To secure the camshaft fixer/locator - T10171A- screw in a M6 screw into the corresponding hole -arrows- by hand; do not tighten.



Note

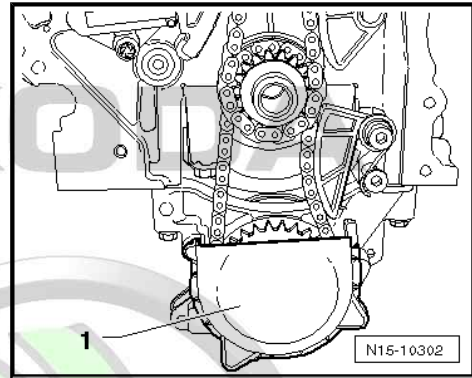
Pay attention that there are different fixing points for the camshaft fixer/locator - T10171A- .

- Remove timing case
⇒ ["2.1 Removing and installing the timing case", page 97](#) .

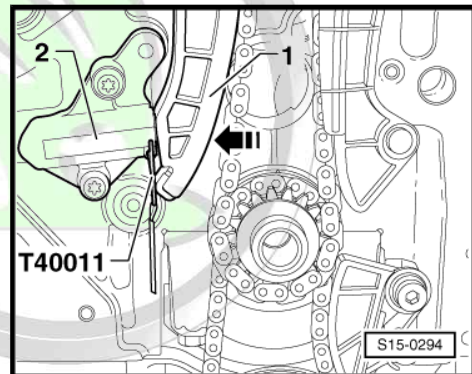




- Pull off cover -1- from chain sprocket of oil pump.



- Press the tensioning rail -1- by hand in -direction of arrow- and interlock the piston of the chain tensioner -2- with the rig pin -T40011- .
- Remove chain tensioner -2-.



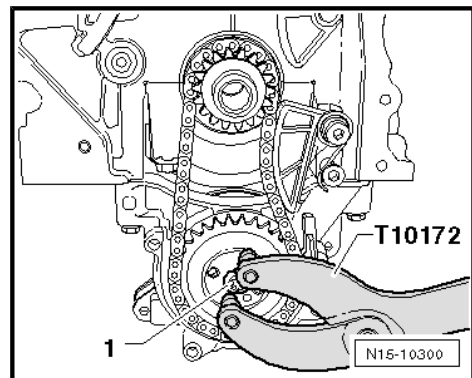
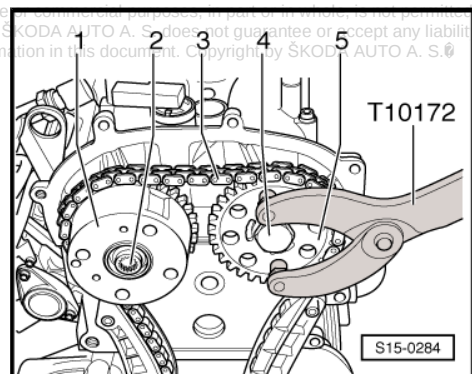
- Mark with a suitable felt-tip pen the direction of rotation of the timing chain -3-.



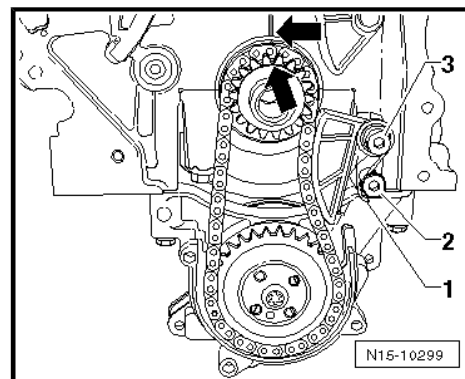
Note

The fixing screw of the camshaft adjuster -2- has a left-hand thread.

- Release screws -2- and -4- and remove the camshaft adjuster -1- with the timing chain -3-. Use counterholder - T10172- to counterhold.
- Hold the chain sprocket of the oil pump with the counterholder - T10172- and slacken the fixing screw -1-.



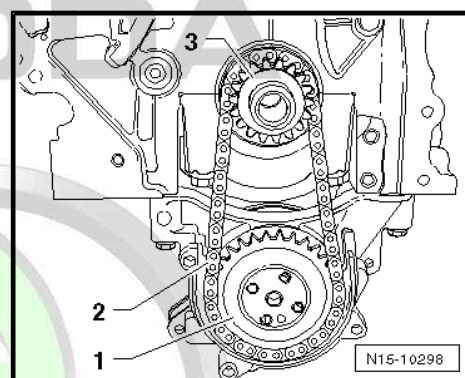
- Lever out tensioning spring -1- at the screw -2- with a screw-driver and remove tensioning spring -1-.
- Unscrew fixing screw -3- and remove the chain tensioner.



- Mark with a suitable felt-tip pen the direction of rotation of the drive chain for oil pump -2-.
- Release the fixing screw of the chain sprocket -1- and remove the chain sprockets -1- and -3- together with the drive chain of the oil pump -2-.

Install

- The crankshaft must be positioned on TDC for cylinder 1.

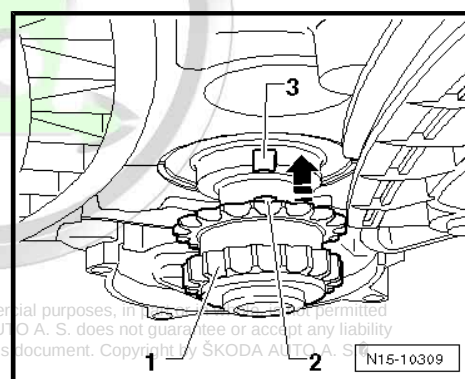


- Push chain sprocket -1- in -direction of arrow- up to the stop onto the crankshaft journal.

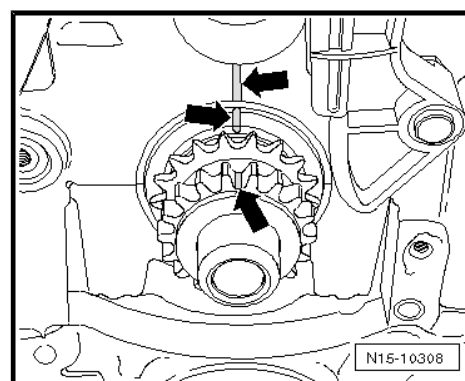


Caution

The integrated peg -2- of the chain sprocket -1- must fit into the slot -3- at the crankshaft stub.



- Mark the positions of the chain sprocket and the crankshaft to the cylinder block with a felt-tip pen.



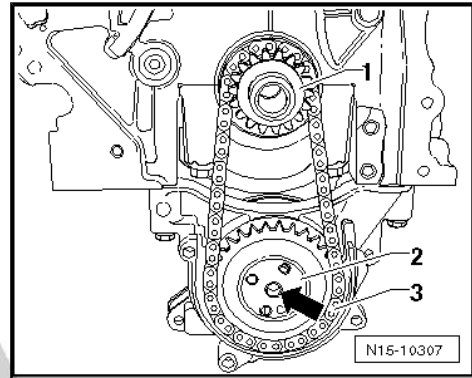


- Fit the drive chain for oil pump -3- onto the chain sprocket -1-.
- Place oil pump sprocket -2- in the oil pump drive chain -3-, place on oil pump shaft and screw on using new screw.

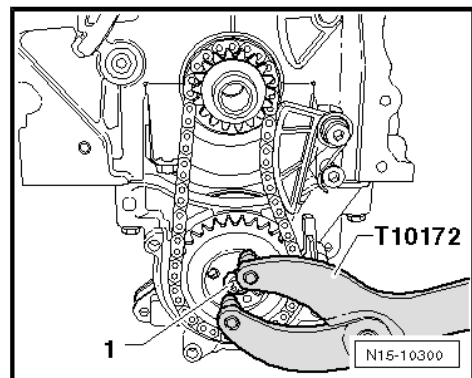


Note

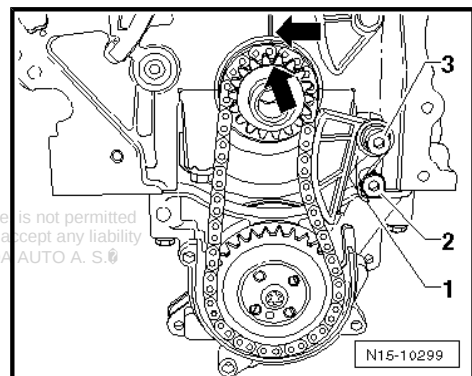
- ◆ *Observe the marking of the running direction on the drive chain for oil pump.*
- ◆ *The drive wheel of the oil pump only adapts to one position on the drive shaft of the oil pump shaft -arrow-.*



- Hold the chain sprocket of the oil pump with the counterholder - T10172- .
- Tighten new fixing screw -1-.



- Position the chain sprocket on the drive chain for the oil pump and tighten the fixing screw -3-.
- Lever the tensioning spring -1- onto the screw -2- with a screw-driver.

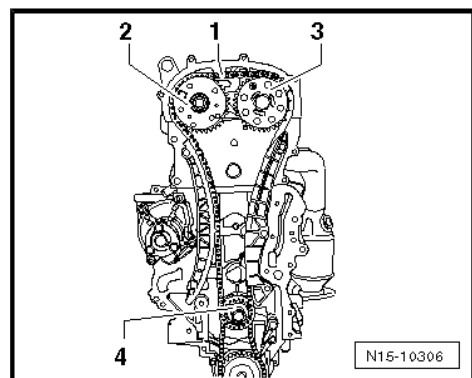


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- ◆ *Observe markings -arrows-.*
- ◆ *The crankshaft should not turn.*

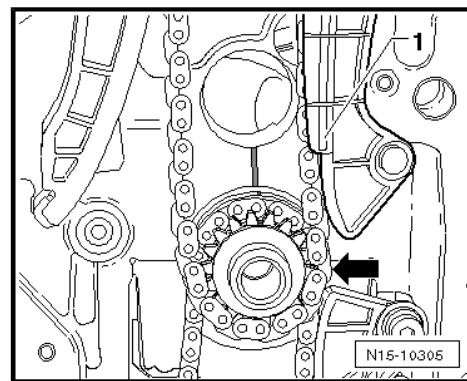
- Screw on the chain sprocket -3- by hand with a new fixing screw.
- Place the timing chain -1- onto the chain sprocket of the crankshaft -4-, the chain sprocket of the outlet camshaft -3- and screw on the camshaft adjuster -2- with a new fixing screw.



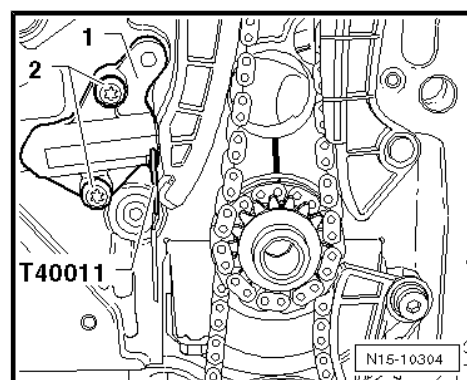
Note

- ◆ *Observe the marking of the running direction on the timing chain -1-.*
- ◆ *Observe that the guide sleeve is installed between the inlet camshaft and camshaft adjuster.*
- ◆ *The fixing screw of the camshaft adjuster -2- has a left-hand thread.*

The timing chain must rest on the sliding rail -1- and on the chain sprocket crankshaft -arrow-.



- Install chain tensioner -1- and tighten fixing screws -2-.
- Tighten the timing chain, by pulling out the rig pin - T40011- from the chain tensioner.
- Check markings on the chain sprocket crankshaft and on the cylinder block; they must be positioned opposite to each other.

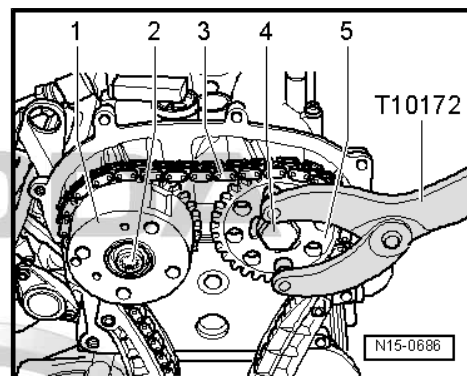


- Tighten the fixing screws -2- and -4- (use counterholder - T10172-).



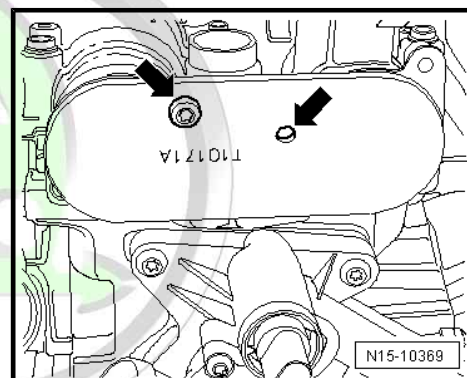
Note

- ◆ First, tighten the fixing screws -2- and -4- by 90°, then check which the timing.
- ◆ The fixing screw of the camshaft adjuster -2- has a left-hand thread.



- Screw out screw -arrows- and remove the camshaft fixer/locator - T10171A- from camshaft housing.
- Test timing ⇒ [“3.3 Checking valve timing”, page 116](#) .

If timing is o.k.:



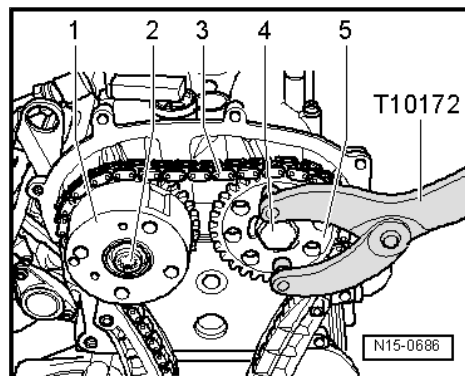


- Hold the camshaft chain sprockets with the counterholder - T10172- and torque screw -2- (left-hand thread) and screw -4- by specified angle with a rigid wrench.

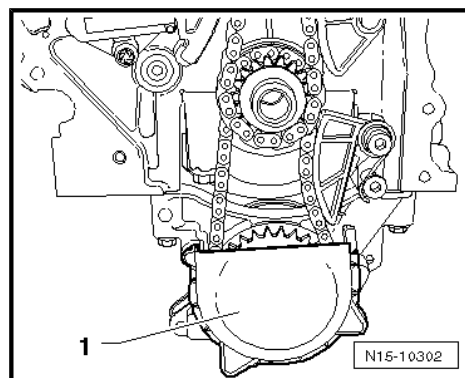


Note

- ♦ The fixing screw of the camshaft adjuster -2- has a left-hand thread.
- ♦ The camshaft chain sprockets must not turn when tightening.



- Install cover for oil pump -1-.
- Install timing case
⇒ [“2.1 Removing and installing the timing case”, page 97](#) .
- Install the vibration damper
⇒ [“1.4 Removing and installing ribbed belt pulley”, page 55](#) .
- Install the V-ribbed belt
⇒ [“1.3 Removing and installing V-ribbed belt”, page 54](#) .
- Replace the gasket rings for the caps of the camshafts and oil before assembly.



Further installation occurs in a similar way in reverse order to removal.

Tightening torques

- ♦ ⇒ [“3.1 Removing and installing engine trim panel”, page 48](#)
- ♦ ⇒ [“3.1 Summary of components - timing chain”, page 105](#)
- ♦ ⇒ [“1.2 Assembly overview - cylinder block \(pulley end\)”, page 51](#)
- ♦ ⇒ [“1.1 Assembly overview - ignition system”, page 314](#)

3.3 Checking valve timing

Special tools and workshop equipment required

- ♦ Adapter for dial gauge - T10170- or -T10170A-
- ♦ Camshaft clamp - T10171A-

Convert camshaft clamp - T10171- to camshaft clamp - T10171A-
⇒ [page 108](#) .

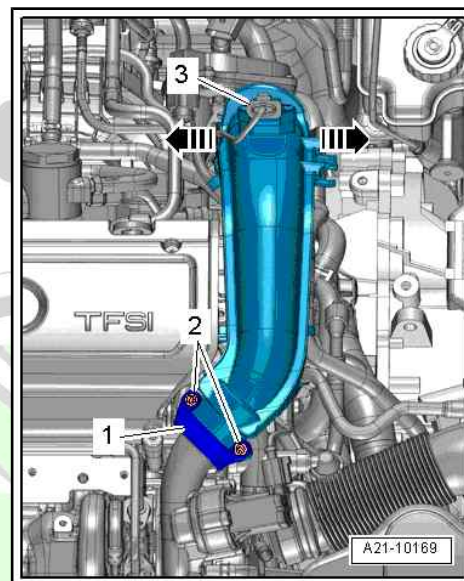
- ♦ Dial gauge , e.g. -VAS 6079-
- ♦ Spark plug wrench , e.g. -3122 B- .

Test sequence

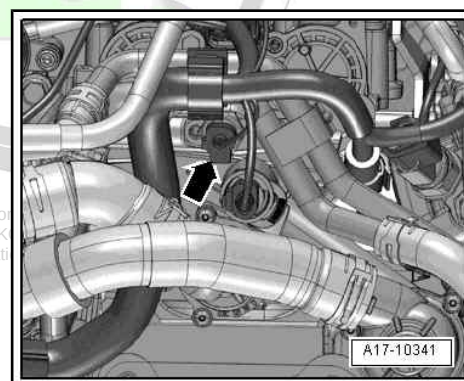
- Remove engine cover
⇒ [“3.1 Removing and installing engine trim panel”, page 48](#) .

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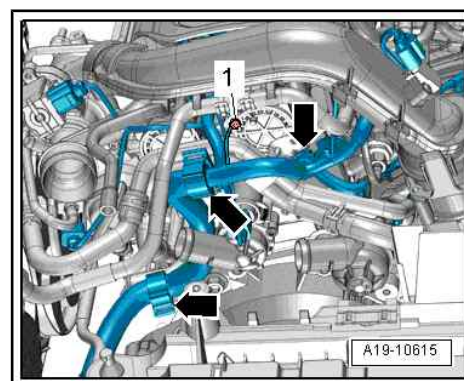
- Unscrew screws -2- and remove retaining bracket -1-.
- Disconnect plug -3- at charge pressure sender - G31- with intake air temperature sender 2 - G299- .
- Expose hoses at the air guide pipe.
- Unlock catches -arrows- and air guide pipe first from the throttle valve control unit - J338- , then from the exhaust gas turbocharger.



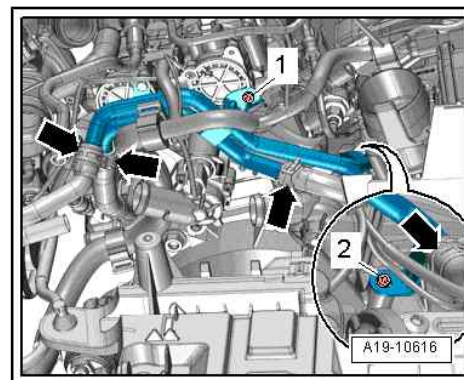
- Disconnect electrical plug connection -arrow- at the oil pressure switch - F1- .



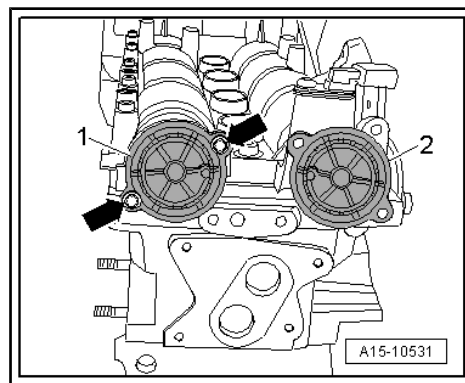
- Unscrew earth cable screw -1-.



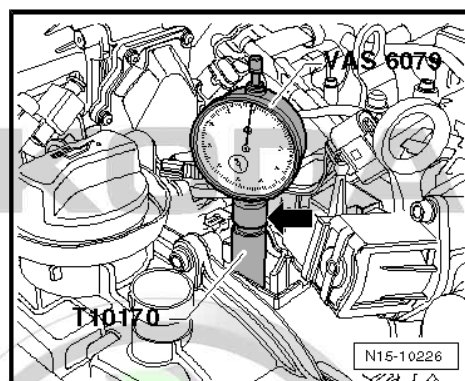
- Unscrew screws -1- and -2- and push left coolant pipe aside to the left.



- Screw out the screws -arrows-, remove cap -1- and -2-.
- Remove ignition coil for cylinder 1
⇒ ["1.2 Removing and installing ignition coils with output stage", page 315](#).
- Remove spark plug with spark plug wrench , e.g. -3122 B- .



- Screw adapter for dial gauge - T10170- up to the stop into the spark plug thread.
- Insert the dial gauge , e.g. -VAS 6079- with extension piece - T10170/1- up to stop and clamp firmly with the clamping screw -arrow-.
- Rotate the crankshaft in direction of rotation of engine on TDC for cylinder 1. Note down the position of the small pointer of the dial gauge.

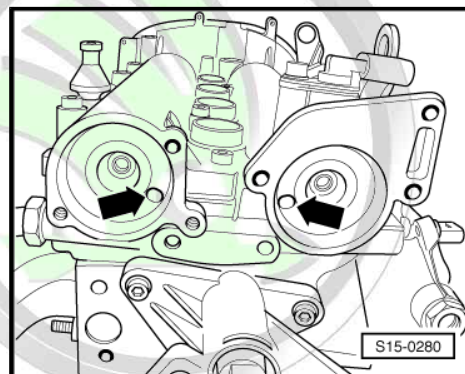


The holes -arrows- in the camshafts must be positioned as shown. If necessary rotate the crankshaft a further revolution (360°).



Note

- ◆ *If the crankshaft was turned more than 0.01 mm past the top dead centre, the crankshaft must once again be turned approx 45° in the opposite direction of rotation of the engine. Then position the crankshaft in direction of rotation of engine on top dead centre for cylinder 1.*
- ◆ *Permissible deviation from TDC for cylinder 1: ± 0.01 mm.*



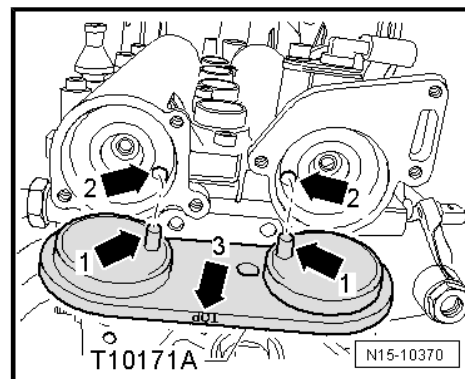
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- Insert camshaft fixer/locator - T10171A- up to the stop into the holes in the camshaft housing.
- The locking bolts -arrows 1- must engage in the holes -arrows 2-. The inscription "TOP" -arrow 3- must be legible from above.



Caution

- ◆ **Before fitting on the camshaft fixer/locator - T10171A- , it is essential to check whether the tensioning sleeves protrude at least 7 mm.**
- ◆ **If this is not the case, then the camshaft fixer/locator is defective and must be replaced.**
- ◆ **The camshaft fixer/locator must not be inserted using force or for example with blows of a hammer.**



If the camshaft fixer/locator - T10171A- cannot be inserted up to the stop in the camshaft openings, the timing is not correct and must be set ⇒ ["3.4 Adjusting valve timing", page 119](#) .

The timing is O.K., if the camshaft fixer/locator - T10171A- can be inserted up to the stop into the camshaft openings.

Further installation occurs in a similar way in reverse order to removal. Pay attention to the following:

- ◆ Replace the gasket rings for the caps of the camshafts and oil before assembly.

Tightening torques

- ◆ ⇒ ["3.1 Removing and installing engine trim panel", page 48](#)
- ◆ ⇒ ["1.1 Assembly overview - ignition system", page 314](#)

3.4 Adjusting valve timing

Special tools and workshop equipment required

- ◆ Adapter for dial gauge - T10170- or -T10170A-
- ◆ Camshaft clamp - T10171A-

Convert camshaft clamp - T10171- to camshaft clamp - T10171A-
⇒ [page 108](#) .

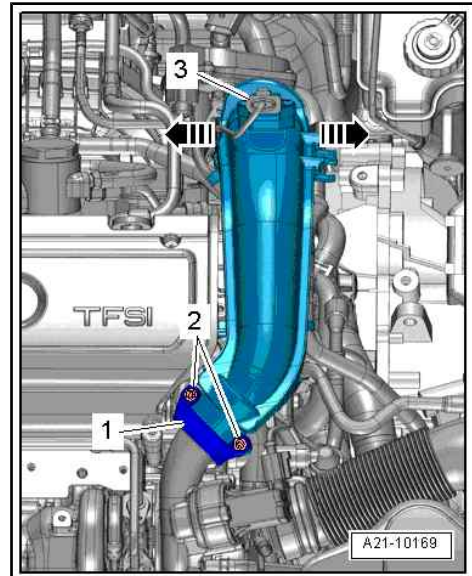
- ◆ Counterholder - T10172-
- ◆ Counterholder - T30004 (3415)-
- ◆ Rig pin - T40011-
- ◆ Dial gauge , e.g. -VAS 6079-
- ◆ Spark plug wrench , e.g. -3122 B- .

Work procedure

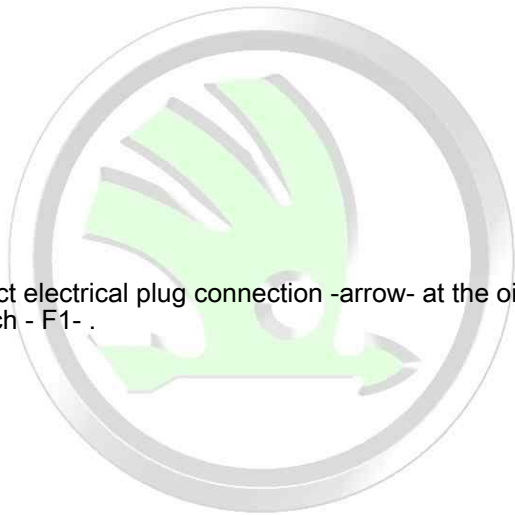
- Remove engine cover
⇒ ["3.1 Removing and installing engine trim panel", page 48](#) .



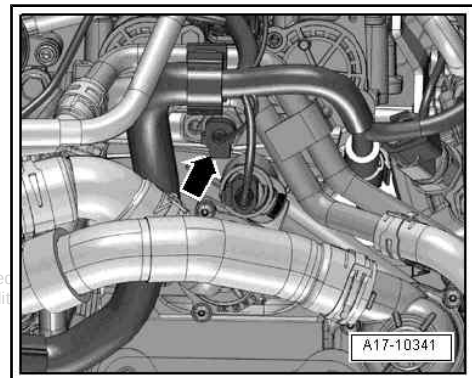
- Unscrew screws -2- and remove retaining bracket -1-.
- Disconnect plug -3- at charge pressure sender - G31- with intake air temperature sender 2 - G299- .
- Expose hoses at the air guide pipe.
- Unlock catches -arrows- and air guide pipe first from the throttle valve control unit - J338- , then from the exhaust gas turbocharger.



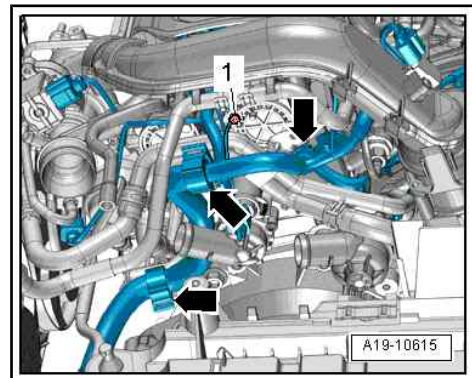
- Disconnect electrical plug connection -arrow- at the oil pressure switch - F1- .



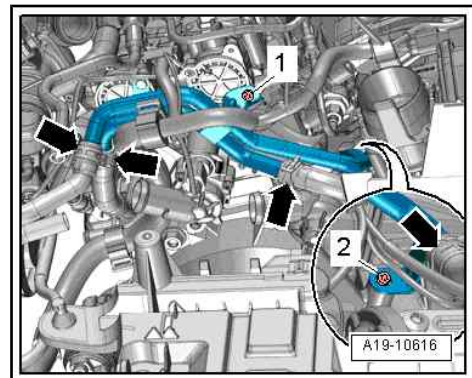
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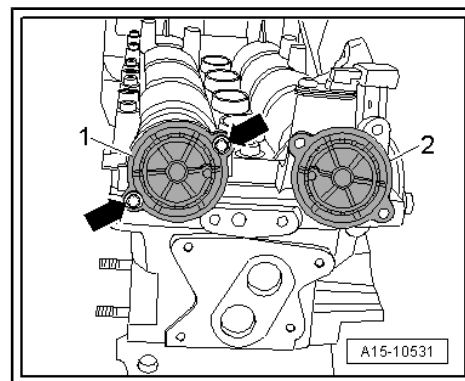
- Unscrew earth cable screw -1-.



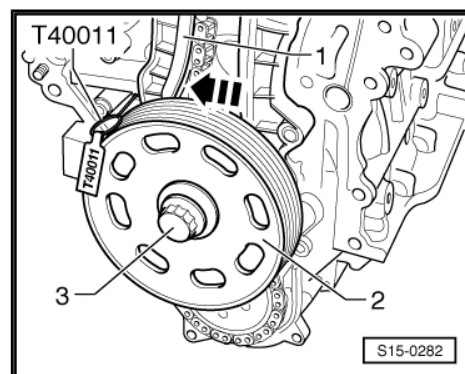
- Unscrew screws -1- and -2- and push left coolant pipe aside to the left.



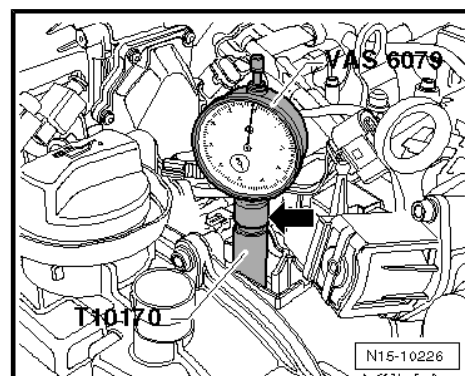
- Screw out the screws -arrows-, remove cap -1- and -2-.
- Remove timing case
⇒ ["2.1 Removing and installing the timing case", page 97](#).



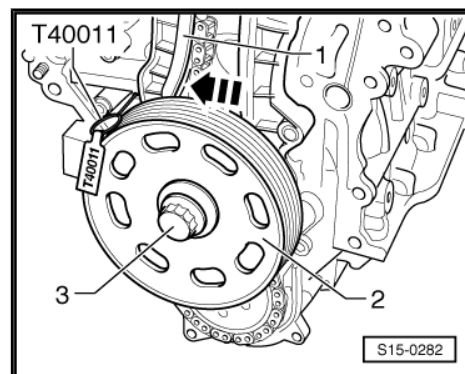
- For turning the crankshaft insert the bushing, insert the vibration damper -2- and the fixing screw -3- and tighten the fixing screw (use counterholder - T30004-).
- Remove ignition coil for cylinder 1
⇒ ["1.2 Removing and installing ignition coils with output stage", page 315](#).
- Remove spark plug with spark plug wrench , e.g. -3122 B- .



- Screw adapter for dial gauge - T10170- up to the stop into the spark plug thread.
- Insert the dial gauge , e.g. -VAS 6079- with extension piece - T10170/1- up to stop and clamp firmly with the clamping screw -arrow-.
- Rotate the crankshaft in direction of rotation of engine on TDC for cylinder 1. Note down the position of the small pointer of the dial gauge.
- Turn crankshaft 45° in the opposite direction of rotation of the engine.



- Press the tensioning rail -1- in -direction of arrow- and interlock the piston with the rig pin - T40011- .



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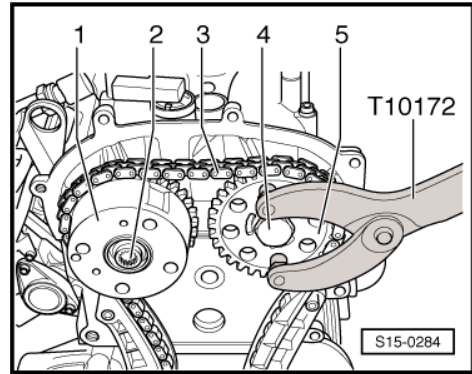
- Mark with a suitable felt-tip pen the direction of rotation of the timing chain -3-.



Note

The fixing screw of the camshaft adjuster -2- has a left-hand thread.

- Release screws -2- and -4- and remove the camshaft adjuster -1- with the timing chain -3-. Use counterholder - T10172- to counterhold.
- Mount again camshaft adjuster -1-.
- Replace and tighten fixing screws -2- and -4- (use counterholder - T10172-).



Note

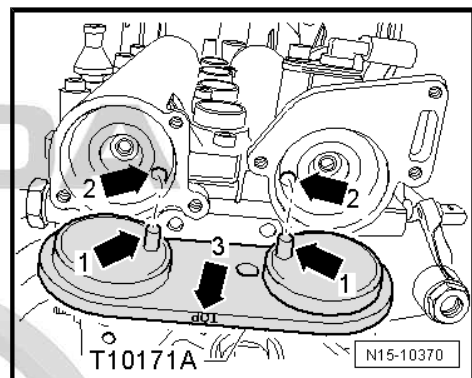
First the fixing screws -2- and -4- are tightened to the torquing angle (90°), after which the timing is checked.

- Turn the inlet and exhaust camshaft until the camshaft fixer/locator - T10171A- can be inserted up to the stop into the camshaft openings.



Caution

- ◆ **Before fitting on the camshaft fixer/locator - T10171A- , it is essential to check whether the tensioning sleeves protrude at least 7 mm.**
- ◆ **If this is not the case, then the camshaft fixer/locator is defective and must be replaced.**
- ◆ **The camshaft fixer/locator must not be inserted using force or for example with blows of a hammer.**



- The locking bolts -arrows 1- must engage in the holes -arrows 2-. The inscription "TOP" -arrow 3- must be legible from above.



Note

When turning, the camshafts must not be moved axially.

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- To secure the camshaft fixer/locator - T10171A- screw in a M6 screw into the corresponding hole -arrows- by hand; do not tighten.



Note

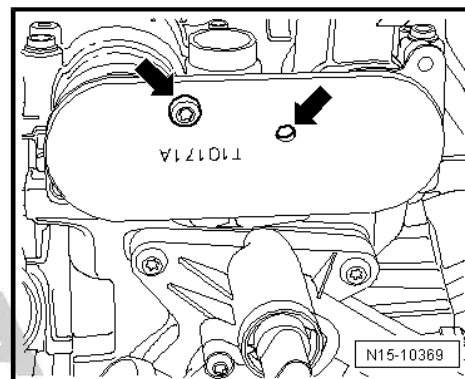
Pay attention that there are different fixing points for the camshaft fixer/locator - T10171A- .

- Slacken the screws of the camshaft chain sprockets. Absolutely use counterholder - T10172- .



Caution

Do not use the camshaft fixer/locator - T10171A- as a counterholder.



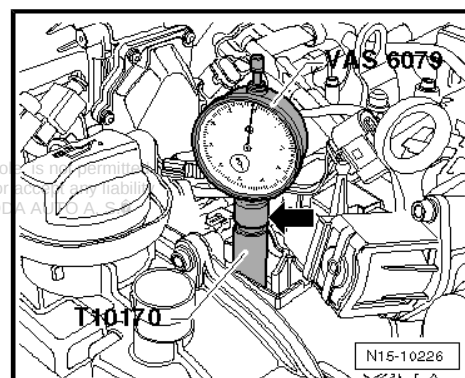
- Removing the camshaft chain sprocket.
- Place the timing chain onto the camshaft chain sprockets in compliance with the running direction and reinsert the removed chain sprocket.
- Screw in the camshaft screws so far so that the camshaft chain sprockets can still be turned on the camshaft.
- Tighten the timing chain, by pulling out the rig pin - T40011- .
- Rotate the crankshaft in direction of rotation of engine on TDC for cylinder 1.
- Permissible deviation from TDC for cylinder 1: ± 0.01 mm.



Note

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If the crankshaft was turned more than 0.01 mm past the top dead centre, the crankshaft must once again be turned approx 45° in the opposite direction of rotation of the engine. Then position the crankshaft in direction of rotation of engine on top dead centre for cylinder 1.



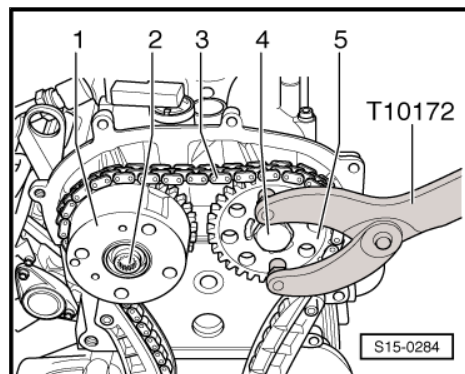


- Hold the camshaft chain sprockets -1- and -5- in this position with the counterholder - T10172- and tighten screws -2- and -4-.



Note

- ♦ The fixing screw of the camshaft adjuster -2- has a left-hand thread.
- ♦ When tightening the camshaft screws, the crankshaft must not turn and the timing chain -3- must remain tightened on both sides.
- ♦ First the fixing screws -2- and -4- are tightened to the torquing angle (90°), after which the timing is checked.



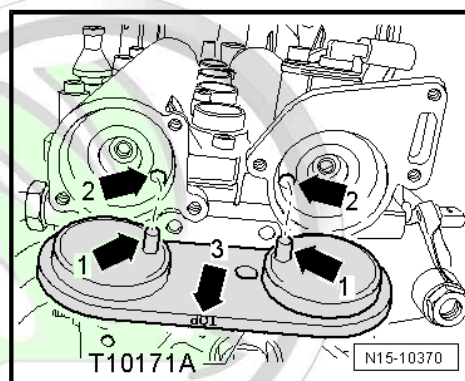
- Remove the camshaft fixer/locator - T10171A- .
- Turn the crankshaft in direction of rotation of engine by 2 turns on TDC for cylinder 1.
- Permissible deviation from TDC for cylinder 1: ± 0.01 mm.

- Insert camshaft fixer/locator - T10171A- up to the stop into the holes in the camshaft housing.

If the camshaft fixer/locator - T10171A- is not insertable.

- Repeat setting.

If the camshaft fixer/locator - T10171A- is insertable.



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- Remove camshaft clamp - T10171A- , hold the camshaft chain sprockets with the counterholder - T10172- and turn screws -2- and -4- by the applicable angle.



Note

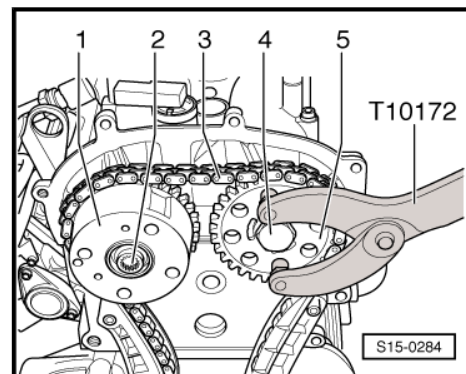
- ◆ The fixing screw of the camshaft adjuster -2- has a left-hand thread.
- ◆ The camshaft chain sprockets must not be turned on the camshaft when tightening.

Further installation occurs in a similar way in reverse order to removal. Pay attention to the following:

- ◆ Install timing case
⇒ [“2.1 Removing and installing the timing case”, page 97](#) .
- ◆ Install the vibration damper
⇒ [“1.4 Removing and installing ribbed belt pulley”, page 55](#) .
- ◆ Install the V-ribbed belt
⇒ [“1.3 Removing and installing V-ribbed belt”, page 54](#) .
- ◆ Replace the gasket rings for the caps of the camshafts and oil before assembly.

Tightening torques

- ◆ ⇒ [“3.1 Removing and installing engine trim panel”, page 48](#) .
- ◆ ⇒ [“3.1 Summary of components - timing chain”, page 105](#)
- ◆ ⇒ [“1.2 Assembly overview - cylinder block \(pulley end\)”, page 51](#)
- ◆ ⇒ [“1.1 Assembly overview - ignition system”, page 314](#)



4 Valve gear

⇒ [“4.1 Assembly overview - valve gear”, page 126](#)

⇒ [“4.2 Measuring axial play of camshaft”, page 128](#)

⇒ [“4.3 Removing and installing valve stem seals”, page 128](#)

4.1 Assembly overview - valve gear

1 - Screw

- ☐ Replace after disassembly
- ☐ Left-hand thread
- ☐ Tightening torque
⇒ [“3.1 Summary of components - timing chain”, page 105](#)

2 - Camshaft adjuster

- ☐ for inlet valves
- ☐ must not be disassembled
- ☐ removing and installing
⇒ [“3.2 Removing and installing timing chain and drive chain for oil pump”, page 108](#)

3 - Sprocket

- ☐ for exhaust camshaft
- ☐ removing and installing
⇒ [“3.2 Removing and installing timing chain and drive chain for oil pump”, page 108](#)

4 - O-ring

- ☐ replace if damaged
- ☐ before fitting moisten lightly with engine oil

5 - Inlet camshaft control valve 1 - N205-

6 - Screw

- ☐ 10 Nm

7 - Screw

- ☐ Replace after disassembly
- ☐ tighten from inside to outside
- ☐ Tightening torque ⇒ [“1.1 Summary of components - cylinder head”, page 81](#)

8 - Camshaft housing

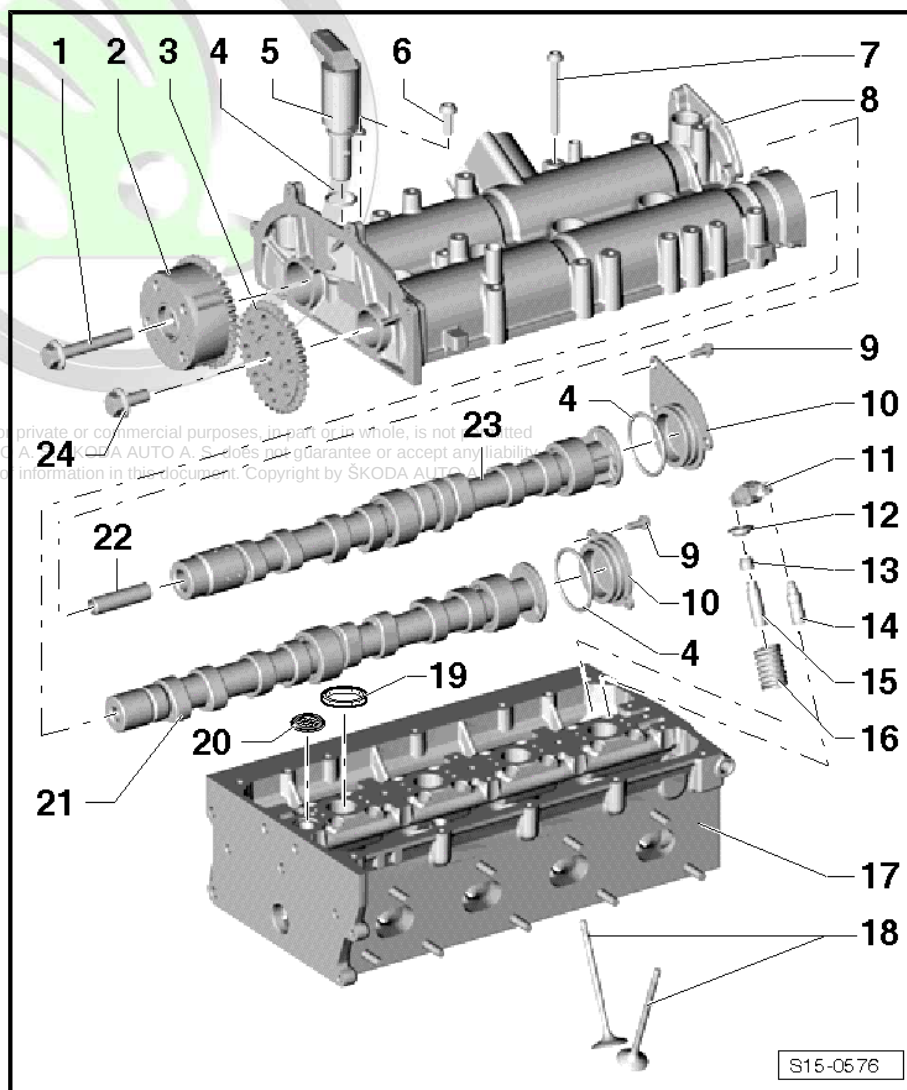
- ☐ removing and installing ⇒ [“1.3 Removing and installing camshaft housing”, page 88](#)

9 - Screw

- ☐ 10 Nm

10 - Screw cap

- ☐ for inlet camshaft
- ☐ for exhaust camshaft



11 - Roller rocker arm

- ☐ inspect roller bearings
- ☐ oil contact surfaces
- ☐ for installing, clip onto the balancing element with the locking clip

12 - Valve spring retainer

13 - Valve stem seal

- ☐ Replace after disassembly
- ☐ removing and installing ⇒ [“4.3 Removing and installing valve stem seals”, page 128](#)

14 - Hydraulic balancing element

- ☐ do not interchange
- ☐ before installing check axial play of the camshafts ⇒ [“4.2 Measuring axial play of camshaft”, page 128](#)
- ☐ Check oil bore
- ☐ oil contact surfaces

15 - Valve guide

- ☐ checking ⇒ [“5.2 Inspect valve guides”, page 135](#) .

16 - Valve spring

17 - Cylinder head

- ☐ removing and installing ⇒ [“1.2 Removing and installing the cylinder head”, page 85](#)
- ☐ reworking valve seats ⇒ [“5.1 Reworking valve seats”, page 133](#)
- ☐ reworking sealing surface ⇒ [Fig. ““Reworking cylinder head sealing surface””, page 128](#)

18 - Valves

- ☐ do not rework, only grinding in is permissible
- ☐ Valve dimensions ⇒ [“5.4 Valve dimensions”, page 136](#)
- ☐ checking ⇒ [“5.3 Testing valves”, page 136](#) .

19 - Sealing ring

- ☐ Replace after disassembly
- ☐ 4 pieces
- ☐ inserted into the cylinder head

20 - Oil strainer

- ☐ Replace after disassembly
- ☐ inserted into the cylinder head

21 - Exhaust camshaft

- ☐ do not mix up with inlet camshaft
- ☐ Inspecting axial play ⇒ [“4.2 Measuring axial play of camshaft”, page 128](#)
- ☐ moisten with oil before installing (also axial bearing collar)

22 - Guide bushing

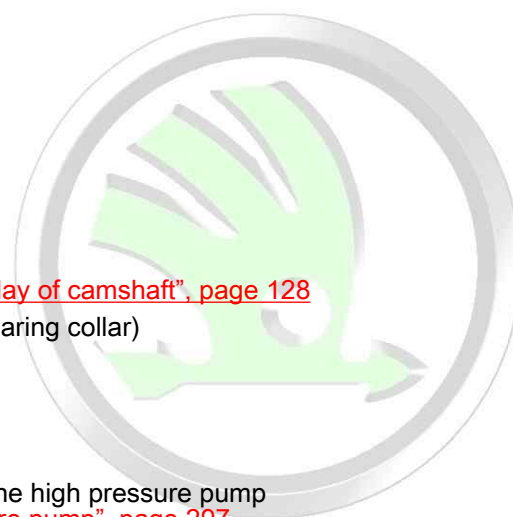
23 - Inlet camshaft

- ☐ with cam for high pressure pump -arrow-
- ☐ before removing, remove the roller tappet of the high pressure pump
⇒ [“7.1 Summary of components - high pressure pump”, page 297](#)
- ☐ do not mix up with exhaust camshaft
- ☐ Inspecting axial play ⇒ [“4.2 Measuring axial play of camshaft”, page 128](#)
- ☐ moisten with oil before installing (also axial bearing collar)

24 - Screw

- ☐ Replace after disassembly
- ☐ Tightening torque ⇒ [“3.1 Summary of components - timing chain”, page 105](#)

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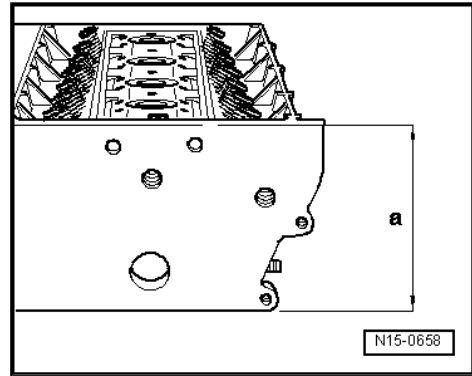
Reworking cylinder head sealing surface

Reworking dimension of cylinder head: -a- = at least 108.25 mm



Note

*If the sealing surface is reworked, the valves should be set lower by the same amount (rework valve seat rings) otherwise the valves will strike the pistons. When doing this, ensure that the permissible minimum dimension is not exceeded
⇒ "5.1 Reworking valve seats", page 133 .*



4.2 Measuring axial play of camshaft

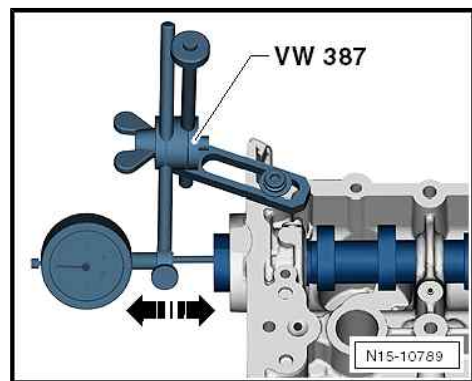
Special tools and workshop equipment required

- ♦ Universal dial gauge holder - MP 3-447 (VW 387)-
- ♦ Dial gauge , e.g. -VAS 6079-

Carry out measurement with the camshaft housing removed and the end cover installed.

inspect camshaft, axial play

- Wear limit: 0.4 mm



4.3 Removing and installing valve stem seals

⇒ "4.3.1 Removing and installing valve stem seal with cylinder head installed", page 128

⇒ "4.3.2 Removing and installing valve stem seal with cylinder head removed", page 129

4.3.1 Removing and installing valve stem seal with cylinder head installed

Special tools and workshop equipment required

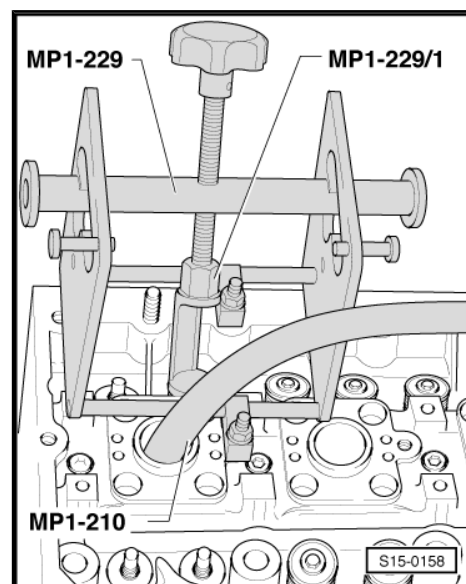
- ♦ Spark plug wrench , e.g. -3122 B-
- ♦ Pressure hose - MP 1-210 (VW 653/3)-
- ♦ Valve lever - MP 1-211 (VW 541/1A/5)-
- ♦ Valve assembly device - MP 1-213 (2036)-
- ♦ Valve supporting plate - MP 1-218-
- ♦ Blank holder for valve spring - MP 1-229 (3362) - with pressure plate - MP 1-229/1 (3362/1)-
- ♦ Extractor - MP 1-230 (3364)-
- ♦ Valve stem seal fitting tool - MP 1-233 (3365)-

Removing

- Remove camshaft housing
⇒ [“1.3 Removing and installing camshaft housing”, page 88](#) .
- Remove roller rocker arm and place on a clean surface. When doing this, ensure that roller rocker fingers are not interchanged.
- Release spark plugs with spark plug wrench , e.g. -3122 B- .
- Put the piston of the relevant cylinder at “bottom dead centre”.
- Screw on blank holder for valve spring - MP 1-229- with pressure plate - MP 1-229/1- .
- Screw the pressure hose - MP 1-210- in the spark plug thread.
- Connect pressure hose to compressed air [min. 0.6 MPa (6° bar) overpressure] and remove the valve springs with blank holder for valve spring - MP 1-229- .
- Pull off valve stem seal with extractor for valve stem seal - MP 1-230- .

Install

- Insert the supplied plastic bushings on the relevant valve stem. This will prevent any damage to the new valve stem seals.

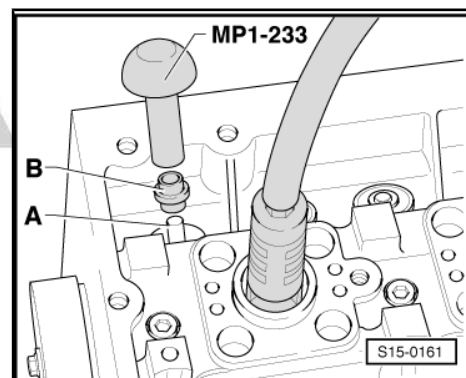


- Insert the new valve stem seal -B- in the insertion tool for valve stem seal -MP 1-233- .
- Oil the sealing lip of the valve stem seal and carefully slide onto the valve guide -A-.

Further installation occurs in a similar way in reverse order to removal.

Tightening torques

- ◆ ⇒ [“1.1 Summary of components - cylinder head”, page 81](#)
- ◆ ⇒ [“1.1 Assembly overview - ignition system”, page 314](#)



4.3.2 Removing and installing valve stem seal with cylinder head removed

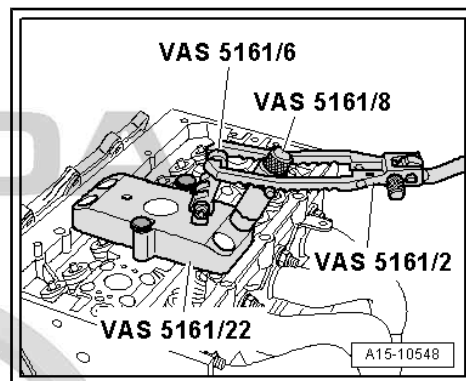
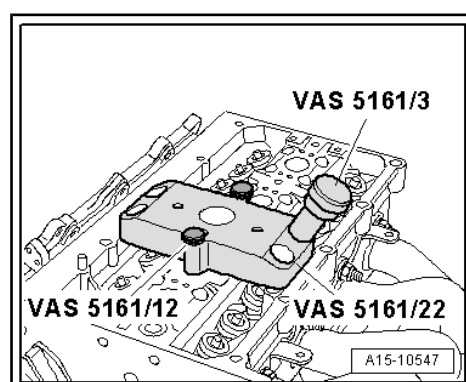
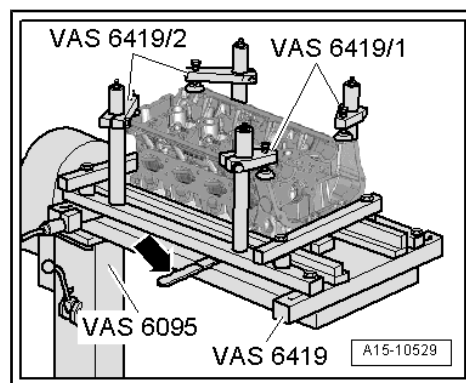
Special tools and workshop equipment required

- ◆ Disassembly and assembly device for valve collets - VAS 5161- with guide plate - VAS 5161/22-
- ◆ Engine and gearbox support - VAS 6095-
- ◆ Cylinder head tensioning device - VAS 6419-
- ◆ Valve shaft pliers , e.g. -VAS 6770-
- ◆ Valve stem seal fitting tool - 3365-

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Work procedure

- Remove cylinder head
⇒ **"1.2 Removing and installing the cylinder head", page 85** .
- Insert the cylinder head tensioning device - VAS 6419- into the engine and gearbox jack - VAS 6095- .
- Tension the cylinder head in the cylinder head tensioning device, as shown in the illustration.
- Connect cylinder head tensioning device to compressed air.
- Adjust the air bellows with the lever -arrow- below the combustion chamber on which the valve stem seals should be removed.
- Allow just enough air to flow into the air bag so that it applied to the valve disc.
- Place guide plate -VAS 5161/22- on the cylinder head and screw on using the knurled screws -VAS 5161/12- .
- Insert the impact drift -VAS 5161/3- into the guide plate and knock off the tightly fitted valve collets using a plastic hammer.
- Screw the detent part -VAS 5161/6- with the interlocking fork -VAS 5161/2- into the guide plate.
- Re-insert the assembly cartridge -VAS 5161/8- into the guide plate.
- Hook the pressure fork -VAS 5161/2- onto the detent part and push the assembly cartridge downwards.
- Turn simultaneously the knurled screw of the assembly cartridge to the right, until the tips click into the valve collets.
- Move the knurled screw to and fro slightly, by doing so the valve collets are pressed apart and are installed in the assembly cartridge.
- Release the pressure fork.
- Remove assembly cartridge.
- Unscrew guide plate and turn it to the side.
- Remove the valve spring with the valve spring retainer.



- Pull off valve stem seal with valve shaft pliers , for example - VAS 6770- .

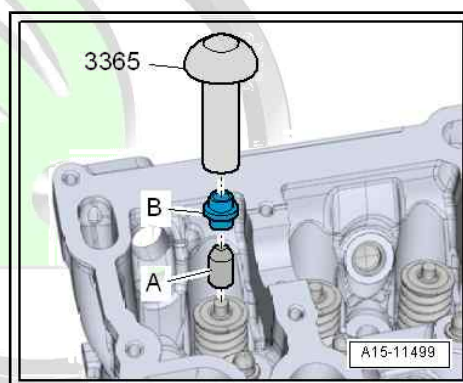


Caution

Risk of damage to valve stem seals during installation.



- Fit the plastic bushing -A-, which is enclosed with the new valve stem seals -B-, onto the valve stem.
- Lightly oil sealing lip of the valve stem seal.
- Slide the valve stem seal onto the plastic bushing.
- Carefully press the valve stem seal with the valve stem seal insertion tool - 3365- onto the valve guide.
- Remove plastic sleeve.



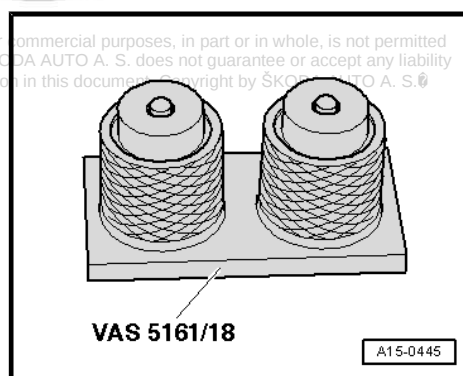
If the valve collets were removed from the assembly cartridge, first of all they must be inserted into the insertion device -VAS 5161/18- .



Note

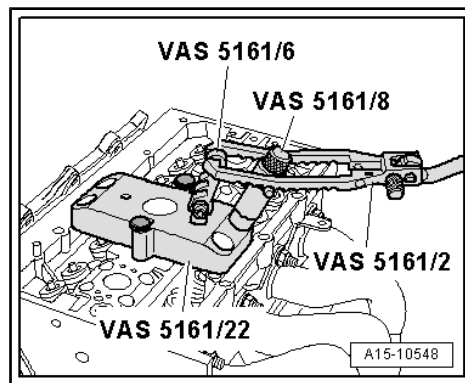
The large diameter of the valve collets points to the top.

- Press the assembly cartridge from the top onto the insertion device for valve collets and lift up the valve collets.
- Insert the valve spring and the valve spring retainer.





- Screw the guide plate -VAS 5161/22- back onto the cylinder head.
- Re-insert the assembly cartridge -VAS 5161/8- into the guide plate.
- Press down the pressure fork and turn the knurled screw to the left and to the right while pulling it upwards, by doing so the valve collets are inserted.
- Release the pressure fork on tightened knurled screw.
- Repeat the procedure for each valve.
- Install cylinder head
⇒ ["1.2 Removing and installing the cylinder head", page 85](#) .



Tightening torques

- ◆ ⇒ ["1.1 Summary of components - cylinder head", page 81](#)

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5 Inlet and exhaust valves

⇒ [“5.1 Reworking valve seats”, page 133](#)

⇒ [“5.2 Inspect valve guides”, page 135](#)

⇒ [“5.3 Testing valves”, page 136](#)

⇒ [“5.4 Valve dimensions”, page 136](#)

5.1 Reworking valve seats

Special tools and workshop equipment required

- ◆ Depth gauge
- ◆ Valve seat machining device



Note

- ◆ *When carrying out repairs on engines with leaking valves, it is not sufficient to machine or replace the valve seats and valves. It is also necessary to inspect the valve guides for wear, particularly on engines with a high mileage
⇒ [“5.2 Inspect valve guides”, page 135](#).*
- ◆ *Valve seats are only to be reworked to the extent required to yield a proper surface appearance. Before beginning to rework valve seats, calculate the maximum permissible reworking dimensions. If the reworking dimension is exceeded, the proper operation of the hydraulic valve clearance compensation is no longer ensured. If this is the case replace the cylinder head.*

The maximum permissible reworking dimension can be calculated as follows:

- Insert valve and press firmly against seat.



Note

If the valve is replaced when carrying out repair work, use a new valve for the measurement.

- Measure distance between the valve stem end and the upper face of the cylinder head.

- Calculate maximum permissible reworking dimension from measured distance and minimum dimension.

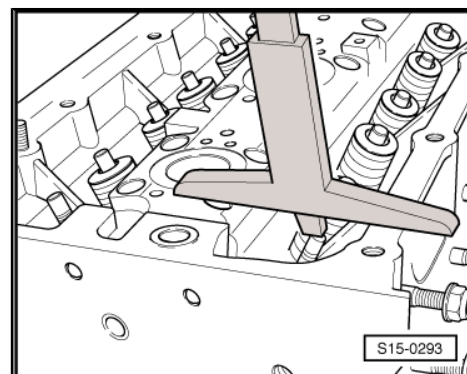
Minimum dimension: Inlet valve	7.6 mm
Minimum dimension: Exhaust valve	7.6 mm

“Measured distance” - “minimum dimension” = “max. permissible reworking dimension”.

Example:

Measured distance	8.0 mm
- Minimum dimension	7.6 mm
= max. permissible reworking dimension *)	0.4 mm

*) The max. permissible reworking dimension is shown in the figures for reworking the valve seats as dimension “b”.



Reworking inlet valve seat

$a = \varnothing 28.7 \text{ mm.}$

$b = \text{max. permissible reworking dimension}$

$c = 1.5 \dots 1.8 \text{ mm}$

$Z = \text{Bottom edge of cylinder head}$

$\alpha = 45^\circ \text{ valve seat angle}$

$\beta = 30^\circ \text{ top correction angle}$

$\gamma = 60^\circ \text{ bottom correction angle}$

Reworking exhaust valve seat

$a = \varnothing 25.0 \text{ mm.}$

$b = \text{max. permissible reworking dimension}$

$c = \text{approx. } 1.8 \text{ mm}$

$Z = \text{Bottom edge of cylinder head}$

$\alpha = 45^\circ \text{ valve seat angle}$

$\beta = 30^\circ \text{ top correction angle}$

$\gamma = 60^\circ \text{ bottom correction angle}$

Work procedure

Reworking can be carried out by hand while complying with the following conditions:

- The wear limit of the valve guides must not exceed the permissible dimension.
- Use NAC milling cutter with carbide metal tips (min. 90 HRC).
- Mill with the milling cutter using slight pressure in such a way that an even removal of swarfs is ensured over the whole working surface.

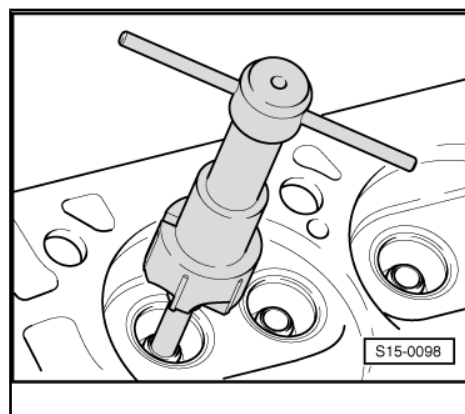
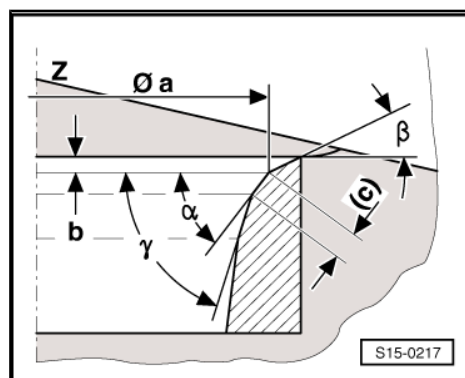
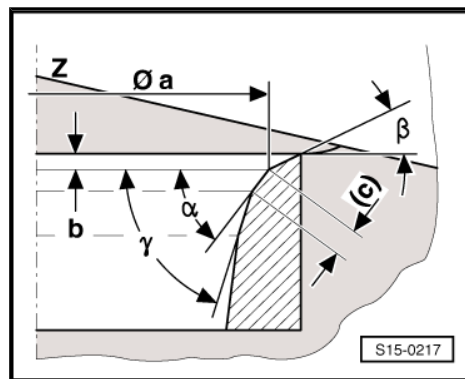
Reworking valve seats with NAC milling cutter

- Place cylinder head on a felt base and secure to prevent it from turning.
- Match diameter of guide drift to diameter of valve guide.

Valve guide	$\varnothing$ Guide drift in mm
Inlet valve	6,0 -0,01
Exhaust valve	

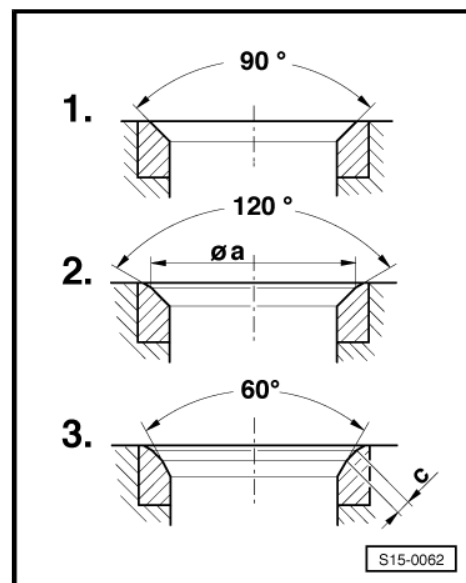
- Match diameter of milling cutter to diameter of valve seat.

Valve seat	$\varnothing$ Milling cutter 90° mm	$\varnothing$ Milling cutter 120° mm	$\varnothing$ Milling cutter 60° mm
Inlet valve	32	32	21/34
Exhaust valve	30	30	21/34



Milling sequence

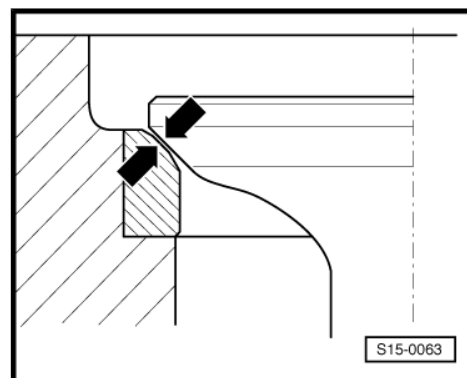
- 1 - Mill valve seat with 90° milling cutter until a perfect contact pattern is achieved. (Do not exceed maximum permissible reworking dimension!)
- 2 - Chamfer top correction angle with 120° milling cutter until valve seat diameter -a- ➤ [page 134](#) is achieved.
- 3 - Mill bottom correction angle with 60° milling cutter until valve seat width -c- is achieved ➤ [page 134](#) .



- Grind in valve/valve seat -arrows- with fine grinding paste so as to achieve a perfect contact pattern.
- Check contact pattern e.g. with water colour (perfect contact pattern over entire circumference).
- Install valve springs.
- Inspect valves for tightness.

The tightness of the valves can be checked by filling petrol into the inlet and outlet canal (no petrol must flow out at the valve seat).

After completing the repair measure once again the distances between the valve stem ends and the upper face of the cylinder head and calculate the maximum permissible reworking dimension.



Note

If the maximum permissible reworking dimension is exceeded, proper operation of the valve gear is no longer assured and the cylinder head must be replaced.

5.2 Inspect valve guides

Special tools and workshop equipment required

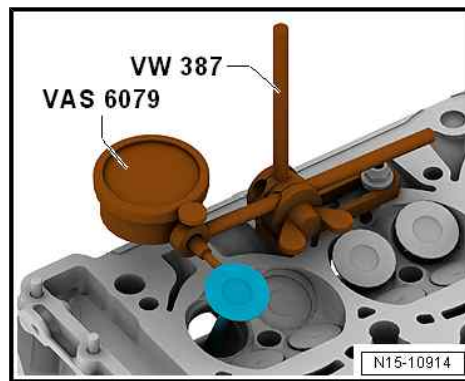
- ◆ Universal dial gauge holder - MP 3-447 (VW 387)-
- ◆ Dial gauge , e.g. -VAS 6079-





Test sequence

- Insert valve into guide. The end of valve stem must be flush with guide. On account of differing stem diameters, only use inlet valve in inlet guide and exhaust valve in exhaust guide.
- Determine valve rock.
- Wear limit: 0.8 mm
- If the wear limit is exceeded, repeat measurement with new valves.
- If the wear limit is again exceeded, replace cylinder head
⇒ **“1.2 Removing and installing the cylinder head”, page 85 .**



Note

The valve guides cannot be replaced.

5.3 Testing valves

- Check valves on the shank and seat surface for scoring.
- If scoring is clearly visible, change valve.

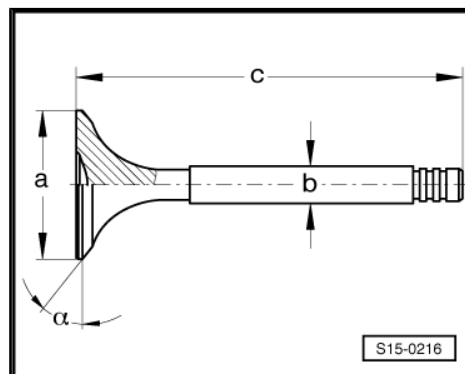
5.4 Valve dimensions



Note

Inlet and exhaust valves must not be reworked. Only grinding in is permissible.

Dimension		Inlet valve	Exhaust valve
Ø a	mm	29,5	26,0
Ø b	mm	5,973	5,953
c	mm	100,9	100,5
α	°	45	45



17 – Lubrication

1 Sump, oil pump

⇒ [“1.1 Assembly overview - sump/oil pump”, page 137](#)

⇒ [“1.2 Engine oil”, page 140](#)

⇒ [“1.3 Removing and installing oil pan”, page 140](#)

⇒ [“1.4 Removing and installing oil pump”, page 144](#)

1.1 Assembly overview - sump/oil pump



Note

- ◆ *If considerable quantities of metal swarf or abrasion are found when carrying out an engine repair, this may indicate damage to the crankshaft and conrod bearings. In order to avoid consequential damage, after the repair perform the following tasks: Clean oil channels carefully; change oil injection nozzles, engine oil cooler and oil filter.*
- ◆ *Fitting location of the oil pressure switch - F1- and tightening torque*
⇒ [Fig. “Fitting location of the oil pressure switch -F1- and tightening torque””, page 140](#).

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1 - Dipstick

- ☐ The oil level must not be above the max. mark!

2 - Engine oil cooler

- ☐ removing and installing
⇒ ["2.1 Removing and installing engine oil cooler", page 147](#)

3 - O-ring

- ☐ Replace after disassembly

4 - Coolant pipe

- ☐ for engine oil cooler
- ☐ Tightening torque for bracket to cylinder block is 20 Nm

5 - Screw

- ☐ Replace after disassembly
- ☐ 8 Nm + 90°

6 - Screw cap

- ☐ Replace seal if damaged

7 - Sealing ring

- ☐ replace if damaged

8 - Oil filter

- ☐ with gasket rings
- ☐ with return-flow check tube
- ☐ slacken and tighten with oil filter wrench - 3417-
- ☐ Pay attention to change intervals:

◆ ⇒ Maintenance ; Booklet Octavia II

◆ ⇒ Maintenance ; Booklet Superb II

◆ ⇒ Maintenance ; Booklet Yeti

◆ ⇒ Maintenance ; Booklet Rapid NH

- ☐ 20 Nm

9 - Timing case

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- ☐ Removing and installing the timing case ⇒ ["2.1 Removing and installing the timing case", page 97](#)

10 - Screw

- ☐ Tightening torque ⇒ ["3.1 Summary of components - timing chain", page 105](#)

11 - Screw

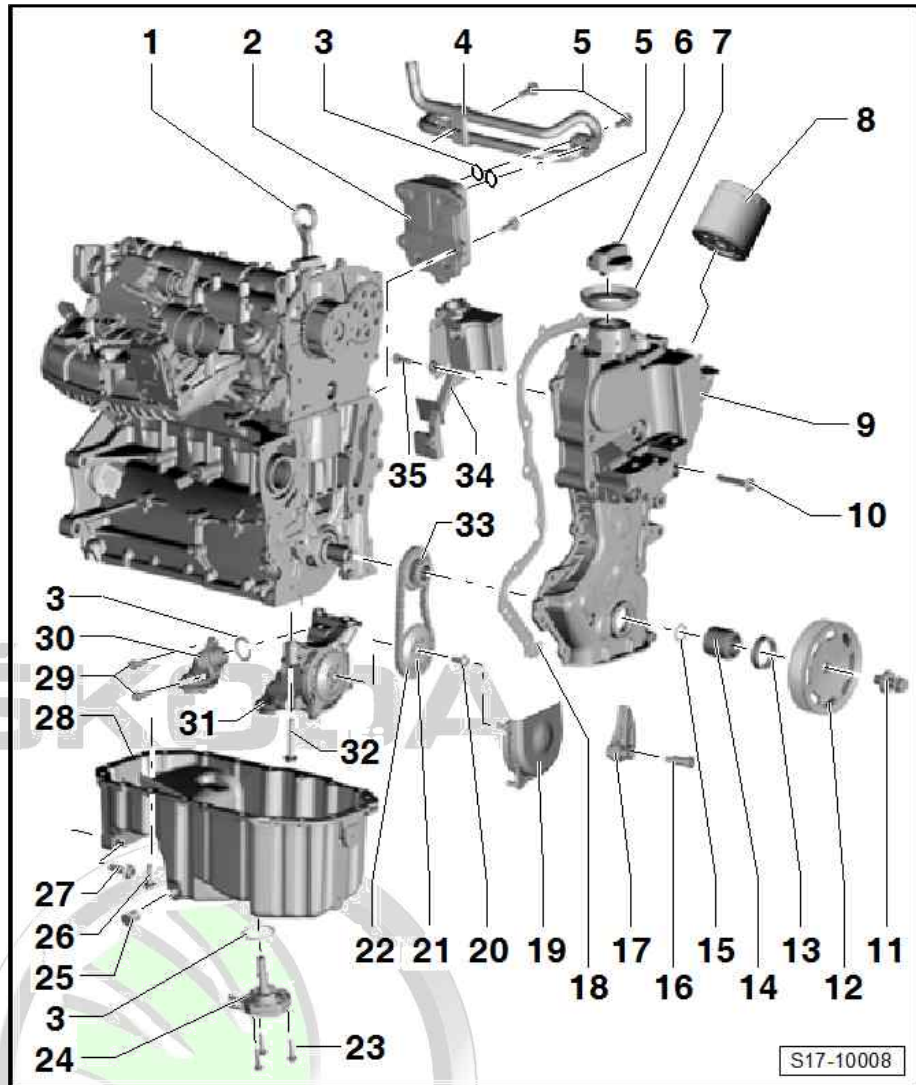
- ☐ Vibration damper
- ☐ Replace after disassembly
- ☐ slacken and tighten ⇒ ["1.4 Removing and installing ribbed belt pulley", page 55](#)

12 - Vibration damper

- ☐ removing and installing ⇒ ["1.4 Removing and installing ribbed belt pulley", page 55](#)

13 - Gasket ring for crankshaft in timing case

- ☐ Replace. ⇒ ["1.6 Replacing crankshaft seal on belt pulley side", page 60](#) .



14 - Distance sleeve

- ☐ The contact surfaces of the distance sleeve must be free of grease and oil.
- ☐ install with new O-ring -Position 15-

15 - O-ring

- ☐ Replace after disassembly
- ☐ in the distance sleeve -Position 14-

16 - Carrier bolt for tensioner

- ☐ Tightening torque ⇒ ["3.1 Summary of components - timing chain", page 105](#)

17 - Chain tensioner with tensioning rail

- ☐ for oil pump drive

18 - Gasket

- ☐ replace if damaged

19 - Cover

20 - Screw

- ☐ Replace after disassembly
- ☐ Tightening torque ⇒ ["3.1 Summary of components - timing chain", page 105](#)

21 - Sprocket

- ☐ for oil pump
- ☐ removing and installing
⇒ ["3.2 Removing and installing timing chain and drive chain for oil pump", page 108](#)
- ☐ counterhold with counterholder - T10172-

22 - Chain

- ☐ removing and installing
⇒ ["3.2 Removing and installing timing chain and drive chain for oil pump", page 108](#)
- ☐ for oil pump
- ☐ mark running direction (installed position) before removing

23 - Screw

- ☐ 10 Nm

24 - Oil level and oil temperature sender - G266-

25 - Oil drain plug

- ☐ Replace after disassembly
- ☐ with integrated gasket ring
- ☐ 30 Nm

26 - Screw

- ☐ Replace after disassembly
- ☐ slacken and tighten only the bolts at the gearbox side with socket insert - T10058-
- ☐ 13 Nm

27 - Screw

- ☐ 40 Nm

28 - Oil pan

- ☐ removing and installing ⇒ ["1.3 Removing and installing oil pan", page 140](#)

29 - Screw

- ☐ 10 Nm

30 - Intake manifold

- ☐ Clean strainer if dirty

31 - Oil pump

- ☐ must be replaced completely



- ☐ removing and installing ⇒ [“1.4 Removing and installing oil pump”, page 144](#)

32 - Screw

- ☐ Replace after disassembly
☐ 14 Nm + 90°

33 - Sprocket

- ☐ for oil pump drive
☐ removing and installing
⇒ [“3.2 Removing and installing timing chain and drive chain for oil pump”, page 108](#)

34 - Oil separator

35 - Screw

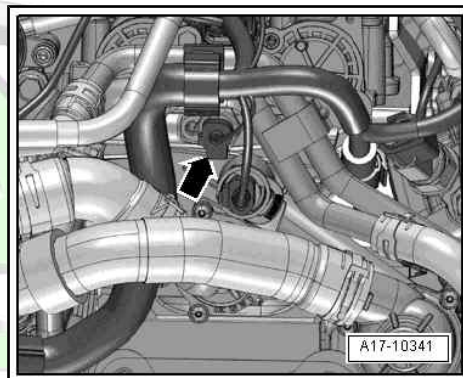
- ☐ 5 Nm

Fitting location of the oil pressure switch - F1- and tightening torque

The oil pressure switch - F1- -arrow- is located to the left at the cylinder head below the cap of both camshafts.

Specified torque

Component	Specified torque
Oil pressure switch - F1-	20 Nm



1.2 Engine oil



Caution

You must check the oil fill level with the engine oil level dipstick after filling.

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Oil quantity, engine oil specifications and engine oil change:

- ◆ ⇒ Maintenance ; Booklet Octavia II .
- ◆ ⇒ Maintenance ; Booklet Superb II .
- ◆ ⇒ Maintenance ; Booklet Yeti .
- ◆ ⇒ Maintenance ; Booklet Rapid NH .



Note

The oil level must not be above the max. mark - danger of damage to catalytic converter!

1.3 Removing and installing oil pan

Special tools and workshop equipment required

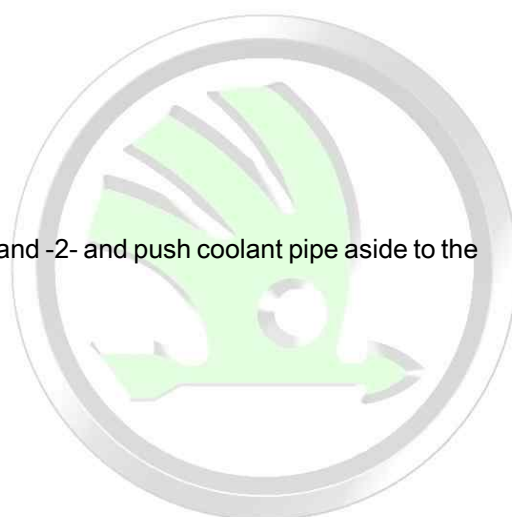
- ◆ Socket insert - T10058-
- ◆ Sealant remover gasket stripper (bearing code GST, bearing article no. R 34402), manufacturer Retech s.r.o.
- ◆ Cleaning and degreasing agent , e.g. -D 009 401 04-

- ◆ Silicone sealant ⇒ ETKA - Electronic catalogue of original parts

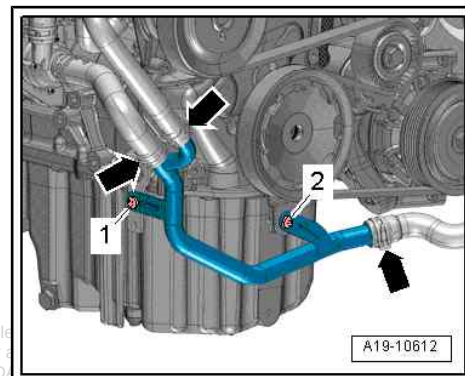
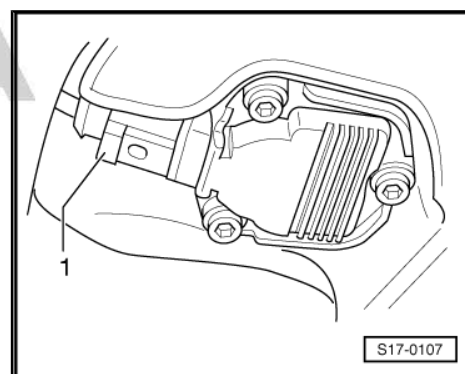
Removing

- Remove the sound dampening system ⇒ Body Work; Rep. gr. 50 .
- Drain engine oil:
 - ◆ ⇒ Maintenance ; Booklet Octavia II .
 - ◆ ⇒ Maintenance ; Booklet Superb II .
 - ◆ ⇒ Maintenance ; Booklet Yeti .
 - ◆ ⇒ Maintenance ; Booklet Rapid NH .
- Remove pre-exhaust pipe
⇒ ["2.1 Summary of components - exhaust gas cleaning", page 309](#) .
- Disconnect plug at oil level and oil temperature sender - G266- .

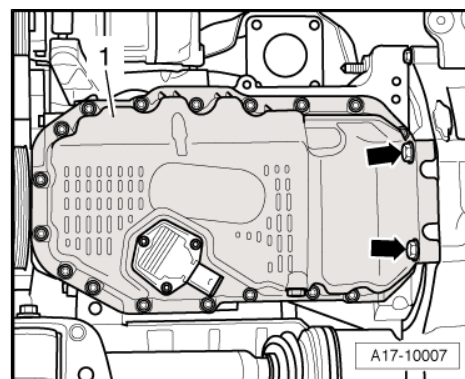
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- Unscrew screws -1- and -2- and push coolant pipe aside to the right.



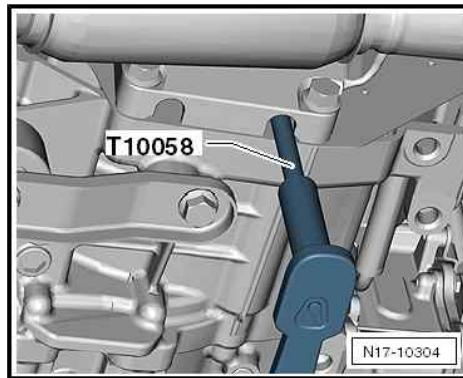
- Unscrew the bolts of oil pan/gearbox -arrows-.
- Loosen crosswise and release the other oil pan screws -1-.





Note

- ◆ Loosen two screws on gearbox side using socket insert - T10058- .
- ◆ It is possible that the oil pan screws are not immediately accessible at the gearbox side by using a socket insert - T10058- . In this case, turn the crankshaft in the direction of rotation of the engine until they can be reached. The flywheel is provided with recesses.
- Remove oil pan, if necessary release by applying slight blows with a rubber-headed hammer.



WARNING

Wear protective gloves when working with sealant and grease remover!

- Remove the remaining sealant on the cylinder block and on the oil pan with chemical sealant remover.
- Degrease the sealing surfaces.

Install



Note

- ◆ Replace M6 oil pan bolts.
 - ◆ Pay attention to the use by date on sealant.
 - ◆ The oil pan must be installed within 5 minutes after applying the silicone sealant.
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WARNING

Risk of contamination of the cylinder block. Cover opened engine parts.

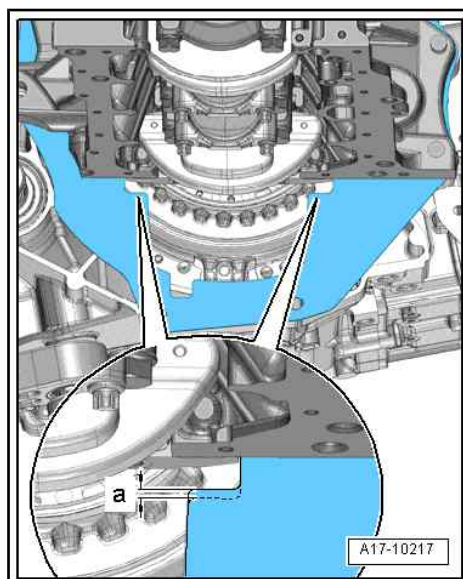
- Lengthen off intermediate plate between engine and gearbox by dimension -a-, as shown in the illustration.

Dimension -a- = 5 mm.

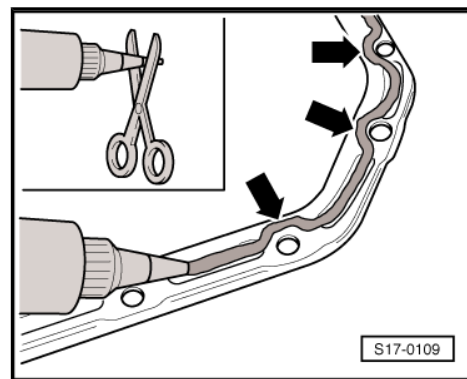


Note

If the intermediate plate is not lengthened off the oil sump with sealant bead cannot be placed on the cylinder block.



- Cut off nozzle tube at the front marking ($\varnothing$ of nozzle approx. 3 mm).
- Apply silicone sealant $\Rightarrow$ ETKA - Electronic Catalogue of Original Parts to the clean sealing surface of the oil pan, as shown in the illustration. Sealant bead must be:
 - ◆ 2...3 mm thick
 - ◆ run past the area around the bolt holes on the inside -arrows-



i Note

- ◆ *The sealant bead must not be thicker otherwise excess sealant may get into the oil pan and clog the strainer in the oil suction pipe.*
- ◆ *Take particular care when applying sealant bead in the area of the sealing flange.*
- Fit oil pan immediately and slightly tighten 2 opposite oil pan bolts.

i Note

- ◆ *When installing the oil pan with the engine removed, ensure that the oil pan is flush with the cylinder block at the flywheel side.*
- ◆ *Pay attention when inserting the oil pan bolts on the flywheel side that the oil pan bolts are inserted in the holes and not between the cylinder block and the flywheel.*
- ◆ *If the oil pan bolts are inadvertently inserted between the cylinder block and the flywheel and can no longer be pulled out, the oil pan must be removed again, the sealing surfaces must be cleaned and the silicone sealant must be replaced.*
- Then slightly tighten both M6 oil pan bolts on the flywheel side.
- Slightly rotate both M10 screws for oil pan/gearbox.
- Slightly tighten the remaining oil pan bolts.
- Tighten the screws of the oil pan to the specified tightening torque.

i Note

After installing the oil pan, allow the silicone sealant to dry for about 30 minutes. Only then may engine oil be filled in.

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Tightening torques

- ◆ $\Rightarrow$ [“1.1 Assembly overview - sump/oil pump”, page 137](#)
- ◆ $\Rightarrow$ [“2.1 Summary of components - exhaust gas cleaning”, page 309](#)
- ◆ Noise insulation $\Rightarrow$ Body Work- Assembly; Rep. gr. 50

Component	Specified torque
Screws for coolant pipes	8 Nm

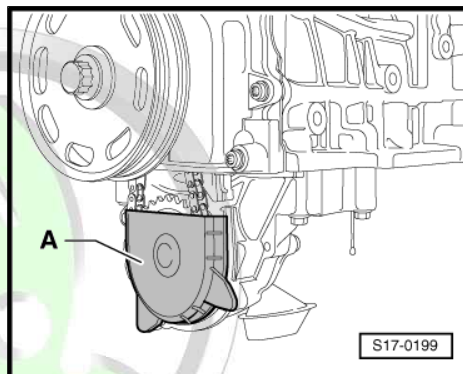
1.4 Removing and installing oil pump

Special tools and workshop equipment required

- ♦ Counterholder - T10172-

Removing

- Removing the oil pan
⇒ "1.3 Removing and installing oil pan", page 140 .
- Unclip the cover for the chain sprocket of the oil pump -A-.



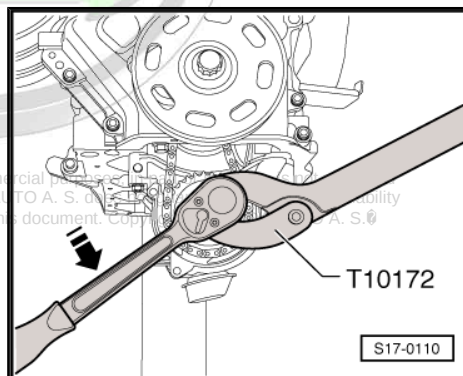
- Hold the chain sprocket of the oil pump with the counterholder - T10172- .
- Loosen the fixing screw of the chain sprocket.



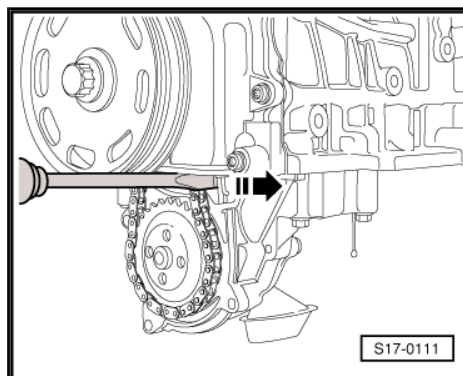
Note

Do not unscrew the screw yet.

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- Press chain tensioner with a screwdriver in -direction of arrow-.
- Release the fixing screw of the chain sprocket.
- Remove chain sprocket from the oil pump and from the chain.



- Unscrew fixing bolts of the oil pump -arrows-.
- Remove the oil pump from the cylinder block.

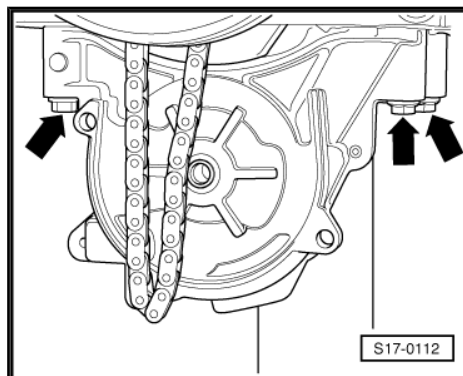
Install



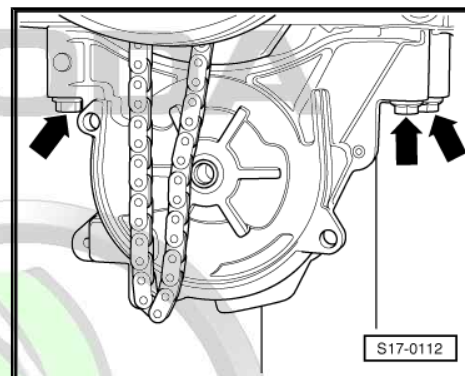
Caution

If a new oil pump or oil suction pipe is installed, the oil feed line at the exhaust gas turbocharger has to be replaced.

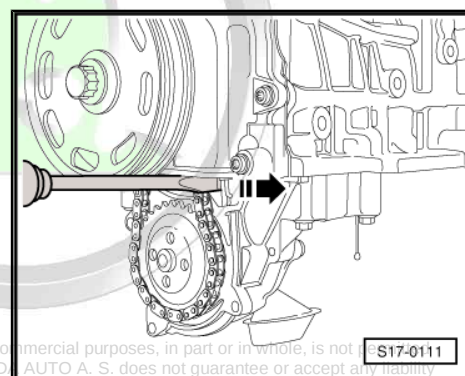
- Fit oil pump onto cylinder block.



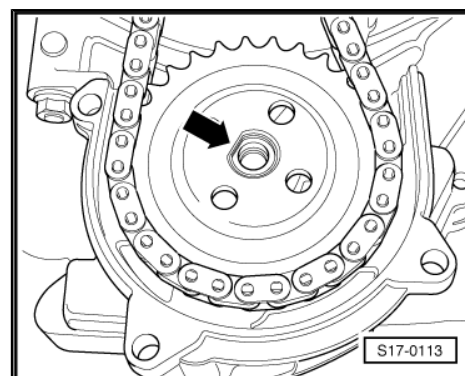
- Tighten the new fixing screws of the oil pump -arrows-.



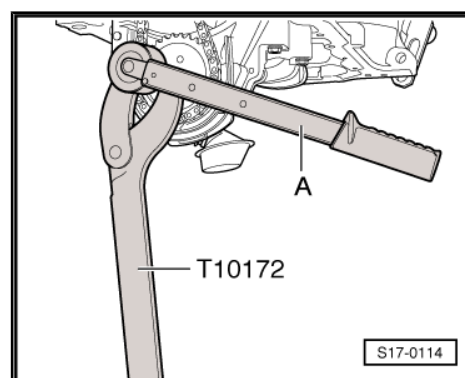
- Press chain tensioner with a screwdriver in -direction of arrow-.
- Insert the chain sprocket into the chain and position on the shaft of the oil pump.



- Pay attention to the seating of the chain sprocket on the shaft of the oil pump -arrow-.
- Screw in new fixing screw for chain sprocket.



- Counterhold the chain sprocket with the counterholder - T10172- .
- Position the torque wrench -A- as shown.
- Tighten fixing screw to tightening torque.

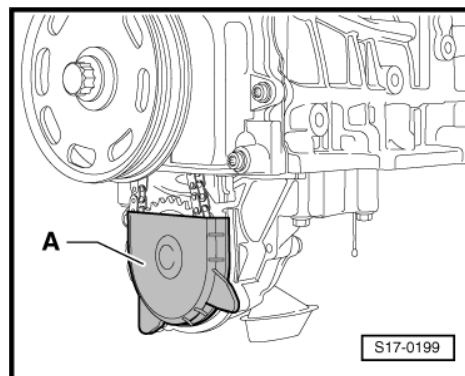




- Install the cover for the chain sprocket of the oil pump -A-.
- Installing the oil pan
⇒ ["1.3 Removing and installing oil pan", page 140](#) .

Tightening torques

- ◆ ⇒ ["1.1 Assembly overview - sump/oil pump", page 137](#)
- ◆ ⇒ ["3.1 Summary of components - timing chain", page 105](#)



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2 Engine oil cooler

⇒ [“2.1 Removing and installing engine oil cooler”, page 147](#)

2.1 Removing and installing engine oil cooler

Special tools and workshop equipment required

- ◆ Catch pan , e.g. -VAS 6208-

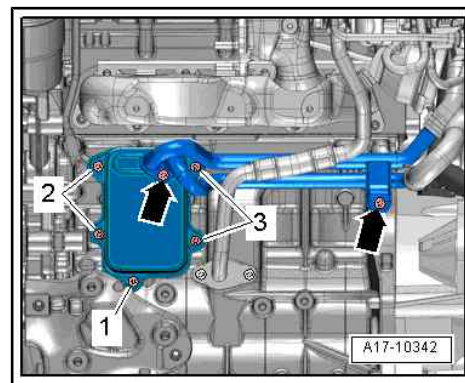
Removing

- Drain the coolant from the cooling system
⇒ [“1.3 Draining and filling coolant”, page 155](#) .
- Remove alternator ⇒ Electrical System; Rep. gr. 27 .
- Unscrew screws -arrows- for coolant pipes at cylinder block and at engine oil cooler.
- Position catch pan for motor oil under the engine.
- Pull out the coolant pipes towards the front out of the engine oil cooler.
- Unscrew screws -1-, -2-, -3- and pull the engine oil cooler off the cylinder block.



Note

For a clearer illustration, the installation position with catalytic converter removed are shown.



Install

Installation is performed in the reverse order, pay attention to the following points:



Note

Replace O-rings.

- Install alternator ⇒ Electrical System; Rep. gr. 27 .
- Top up coolant
⇒ [“1.3 Draining and filling coolant”, page 155](#) .



Note

If the engine oil cooler was replaced, the coolant must be renewed.

Tightening torques

- ◆ ⇒ [“1.1 Assembly overview - sump/oil pump”, page 137](#)
- ◆ AC generator ⇒ Electrical System; Rep. gr. 27

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3 Testing oil pressure

⇒ "3.1 Testing oil pressure and oil pressure switch", page 148

3.1 Testing oil pressure and oil pressure switch

Special tools and workshop equipment required

- ◆ Flexible-head wrench SW 24 - T40175-
- ◆ Oil pressure tester , e.g. -V.A.G 1342-
- ◆ Voltage tester , e. g. -V.A.G 1527 B-
- ◆ Measuring tool set , e.g. -V.A.G 1594C-

Conditions

- Coolant temperature at least 80°C (radiator fan must have run at least once).
- Engine oil level o.k., test:
 - ◆ ⇒ Maintenance ; Booklet Octavia II .
 - ◆ ⇒ Maintenance ; Booklet Superb II .
 - ◆ ⇒ Maintenance ; Booklet Yeti .
 - ◆ ⇒ Maintenance ; Booklet Rapid NH .

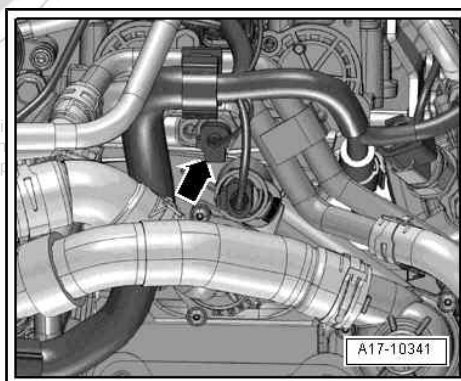


Note

Functional test and repair of the visual and acoustic oil pressure display ⇒ Current flow diagrams, Electrical fault finding and Fitting locations, ⇒ Vehicle diagnostic tester.

Test sequence

- Remove the oil pressure switch in the left cylinder head -arrow- with the flexible-head wrench 24 - T40175- .



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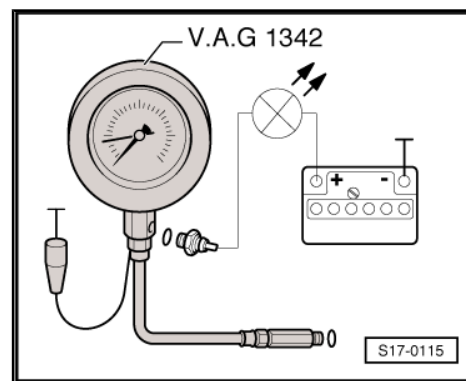
- Screw oil pressure switch into the test equipment.
- Screw tester into cylinder head in place of oil pressure switch.
- Connect brown wire of tester to earth (-).
- Connect voltage tester to battery positive terminal and to oil pressure switch.
- The LED must not light up.

If the LED lights up:

- Replace oil pressure switch - F1- .

If the LED does not light up:

- Start engine and increase engine speed.
- Given an oil pressure of 0.03...0.07 MPa (0.3...0.7 bar) the LED must light up, otherwise replace the oil pressure switch.
- Increase engine speed further.
- At 2000 rpm and an oil temperature of 80 °C the oil pressure must be at least 0.2 MPa (2.0 bar).
- At a higher engine speed the oil pressure must not be greater than 0.7 MPa (7 bar).



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19 – Cooling

1 Cooling system, coolant

⇒ [“1.1 Connection diagram - coolant hoses”, page 150](#)

⇒ [“1.2 Checking the coolant system for leaktightness”, page 153](#)

⇒ [“1.3 Draining and filling coolant”, page 155](#)

1.1 Connection diagram - coolant hoses

⇒ [“1.1.1 Connection diagram - coolant hoses \(Octavia II, Superb II and Yeti\)”, page 150](#)

⇒ [“1.1.2 Connection diagram - coolant hoses \(Rapid NH\)”, page 152](#)

1.1.1 Connection diagram - coolant hoses (Octavia II, Superb II and Yeti)



Note

- ◆ *The engine has two independent cooling systems.*
- ◆ *The expansion reservoir supplies both cooling systems.*
- ◆ *Cooling system (light coloured components)*
- ◆ *Charge air cooling system (dark coloured components)*
- ◆ *The arrows point in the coolant flow direction.*



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1 - Expansion reservoir

- ☐ Check pressure relief valve
⇒ [“1.2 Checking the coolant system for leak-tightness”, page 153](#)

2 - Coolant recirculation pump - V50-

- ☐ removing and installing
⇒ [“2.3.1 Removing and installing coolant recirculation pump V50”, page 162](#)

3 - Charge air cooler

- ☐ in the intake manifold
⇒ [“2.1.1 Summary of components - charge air system \(Octavia II, Superb II and Yeti\)”, page 255](#)

4 - Non-return valve

- ☐ in the coolant hose, not visible from the outside

5 - Heat exchanger of heating system

6 - Thermostat housing

7 - Throttle aperture

- ☐ in the coolant hose, not visible from the outside

8 - Engine oil cooler

9 - Radiator

- ☐ removing and installing
⇒ [“3.2 Removing and installing radiator”, page 169](#)

10 - Charge air cooling circuit radiator

- ☐ removing and installing
⇒ [“3.3 Removing and installing charge air cooling circuit radiator \(Octavia II, Superb II, Yeti\)”, page 172](#)

11 - Exhaust gas turbocharger

12 - Cylinder head and cylinder block

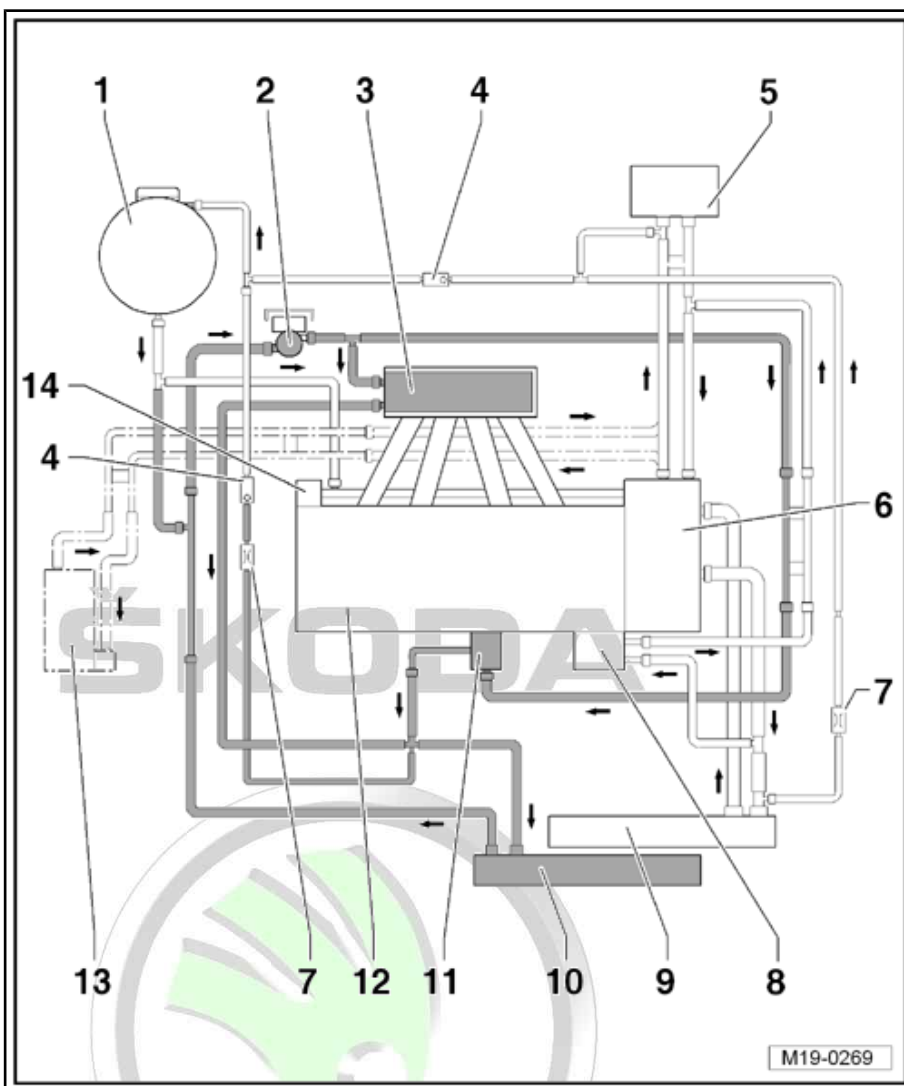
- ☐ fill with fresh coolant after replacing

13 - Auxiliary heating

- ☐ for vehicles with auxiliary heating only

14 - Coolant pump

- ☐ removing and installing ⇒ [“2.4 Removing and installing coolant pump”, page 162](#)



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1.1.2 Connection diagram - coolant hoses (Rapid NH)



Note

- ♦ The engine has two independent cooling systems.
- ♦ The expansion reservoir supplies both cooling systems.
- ♦ Blue = large coolant circuit.
- ♦ Red = small coolant circuit.
- ♦ Orange = coolant circuit for charge air cooler.
- ♦ Brown = heating coolant circuit.
- ♦ The arrows point in the coolant flow direction.

1 - Charge air cooler

- ❑ removing and installing
⇒ ["3.2 Removing and installing radiator", page 169](#)

2 - Engine oil cooler

3 - Exhaust gas turbocharger

4 - Cylinder head and cylinder block

- ❑ fill with fresh coolant after replacing

5 - Coolant pump

- ❑ removing and installing
⇒ ["2.4 Removing and installing coolant pump", page 162](#)

6 - Non-return valve

- ❑ the arrow points in the coolant flow direction.

7 - Expansion reservoir

8 - Screw cap

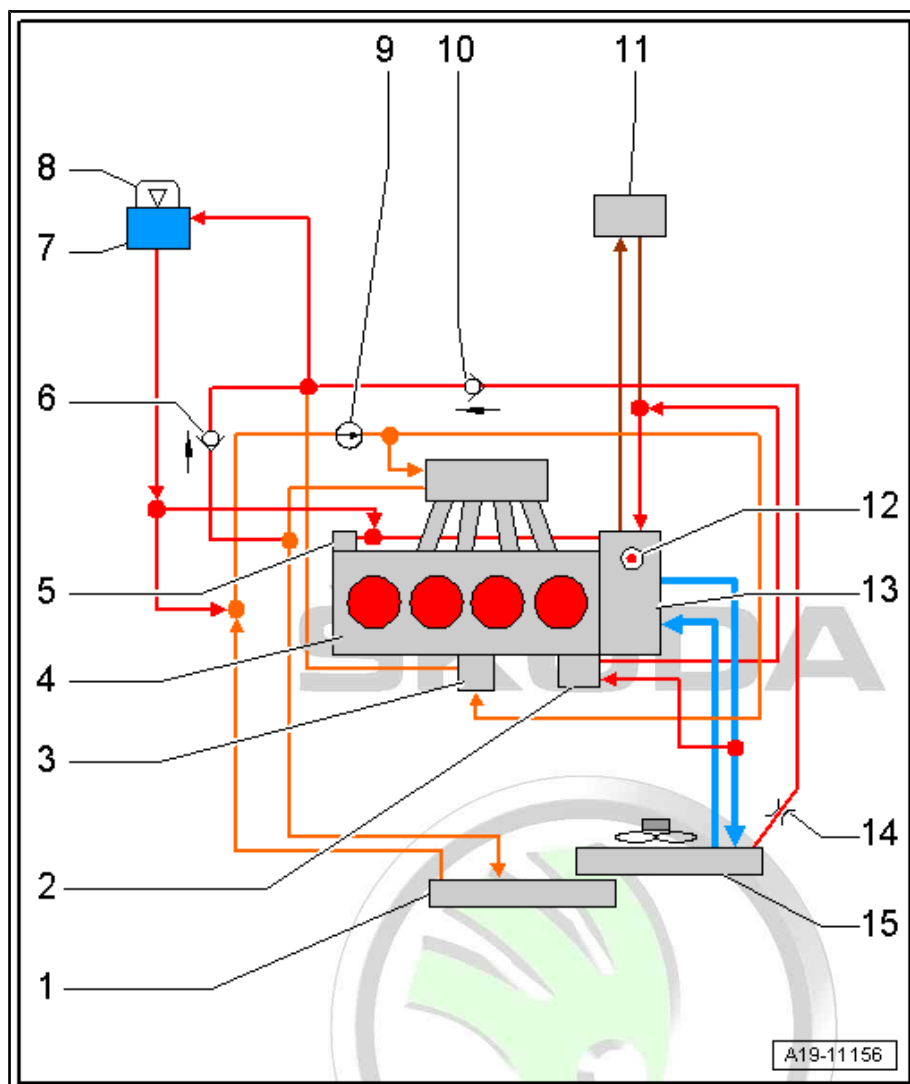
- ❑ for coolant expansion tank
- ❑ Check pressure relief valve
⇒ ["1.2 Checking the coolant system for leak-tightness", page 153](#)

9 - Coolant recirculation pump - V50-

- ❑ removing and installing
⇒ ["2.3.1 Removing and installing coolant recirculation pump V50", page 162](#)

10 - Non-return valve

- ❑ the arrow points in the coolant flow direction.



11 - Heat exchanger of heating system

12 - Coolant temperature sender - G62-

13 - Thermostat housing

14 - Throttle aperture

- ☐ in the coolant hose, not visible from the outside

15 - Coolant radiator

- ☐ removing and installing ⇒ [“3.2 Removing and installing radiator”, page 169](#)

1.2 Checking the coolant system for leak-tightness

⇒ [“1.2.1 Inspecting coolant system with cooling system testing device V.A.G 1274 for tightness”, page 153](#)

⇒ [“1.2.2 Inspecting coolant system with cooling system testing device V.A.G 1274 B for tightness”, page 154](#)

1.2.1 Inspecting coolant system with cooling system testing device - V.A.G 1274- for tightness

Special tools and workshop equipment required

- ◆ Cooling system testing device e.g. -V.A.G 1274-
- ◆ Adapter for cooling system testing device , e.g. -V.A.G 1274/8-
- ◆ Adapter for cooling system testing device , e.g. -V.A.G 1274/9-

Test condition

- Engine is at operating temperature.

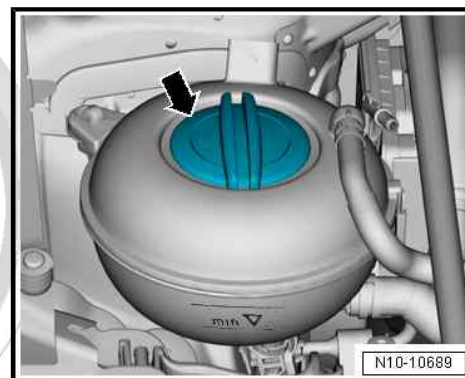
Test sequence



WARNING

Hot steam may escape when the coolant expansion reservoir is opened. Wear safety goggles and safety clothing, in order to avoid eye injuries and scalding. Cover the cap with a cloth and open carefully.

- Open cap -arrow- for coolant expansion tank.



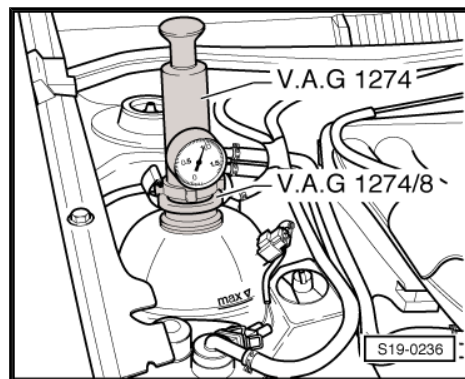


- Position the cooling system testing device - V.A.G 1274- with adapter - V.A.G 1274/8- on the coolant expansion reservoir.
- Using the hand pump of the testing device generate an over-pressure of approx. 0.1 MPa (1.0 bar).

If the pressure drops:

- Search position of the leak and repair fault.

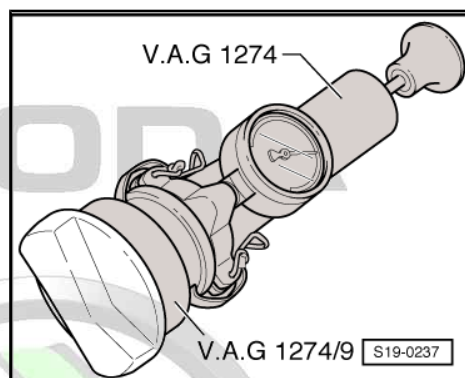
Testing the pressure relief valve in the cap



- Position the cooling system testing device - V.A.G 1274- with adapter - V.A.G 1274/9 - on the cap.
- Operate the handpump.
- The pressure relief valve should open at a pressure of 0.14...0.16 MPa (1.4...1.6 bar).

If the pressure relief valve does not open:

- Replace cap.



1.2.2 Inspecting coolant system with cooling system testing device - V.A.G 1274 B- for tightness

Special tools and workshop equipment required

- ◆ Cooling system testing device e.g. -V.A.G 1274 B-
- ◆ Adapter for cooling system testing device , e.g. -V.A.G 1274/8-
- ◆ Adapter for cooling system testing device , e.g. -V.A.G 1274/9-

Test condition

- Engine is at operating temperature.

Test sequence

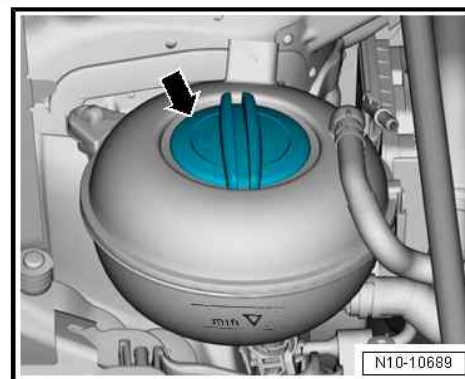
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WARNING

Hot steam may escape when the coolant expansion reservoir is opened. Wear safety goggles and safety clothing, in order to avoid eye injuries and scalding. Cover the cap with a cloth and open carefully.

- Open cap -arrow- for coolant expansion tank.
- Screw the adapter for cooling system testing device - V.A.G 1274/8- into the coolant expansion bottle.



- Fit the cooling system testing device - V.A.G 1274 B- with adapter -V.A.G 1274/8- onto the coolant expansion tank.
- Using the hand pump of the testing device generate an over-pressure of approx. 0.1 MPa (1.0 bar).

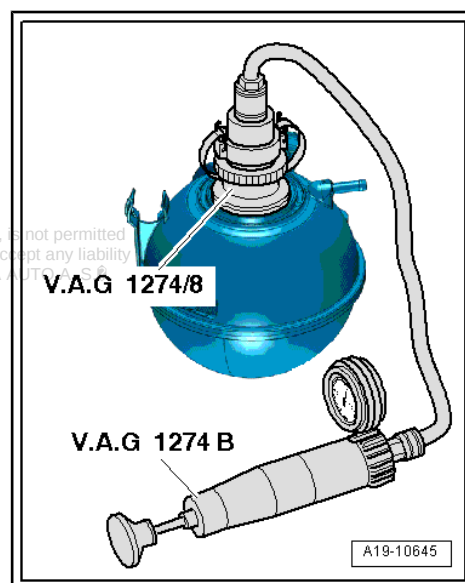


WARNING

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- ◆ *Before the cooling system testing device - V.A.G 1274 B- is separated from the connecting hose or the connecting piece - V.A.G 1274 B/1- , the existing pressure must absolutely be released.*

- ◆ *For this step, press the pressure relief valve on the cooling system testing device - V.A.G 1274 B- and hold it pressed until the pressure gauge indicates the value »0«.*



If the pressure drops:

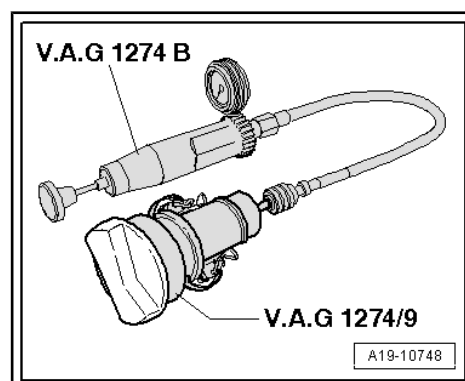
- Search position of the leak and repair fault.

Testing the pressure relief valve in the cap

- Screw the screw cap into the adapter for cooling system testing device - V.A.G 1274/9- .
- Clamp connector - V.A.G 1274 B/1- into adapter for cooling system tester - V.A.G 1274/9- .
- Join connection piece - V.A.G 1274 B/1- to cooling system tester - V.A.G 1274 B- using connecting hose supplied.
- Operate the handpump.
- The pressure relief valve should open at a pressure of 0.14...0.16 MPa (1.4...1.6 bar).

If the pressure relief valve does not open:

- Replace cap.



1.3 Draining and filling coolant

Special tools and workshop equipment required

- ◆ Catch pan , e.g. -VAS 6208-
- ◆ Pliers for spring strap clips , e.g. -VAS 6340-
- ◆ Refractometer



Draining



Note

- ◆ Collect drained coolant in a container for proper disposal.
- ◆ Observe the disposal instructions.



Caution

Dispose of drained oil. The coolant must not be re-used.



WARNING

Hot steam may escape when the compensation bottle is opened.

- ◆ When the engine is warm, the cooling system is under overpressure.
- ◆ Wear safety goggles and safety clothing, in order to avoid eye injuries and scalding.
- ◆ Cover the cap with a cloth and open carefully.

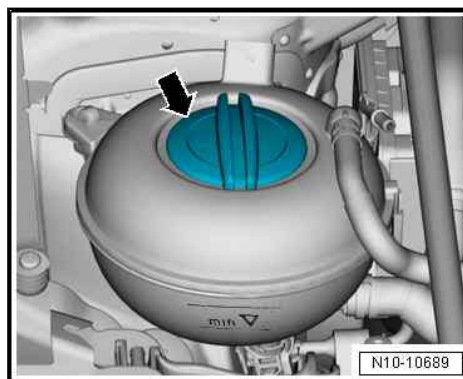
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- Open cap -arrow- for coolant expansion tank.
- Remove the sound dampening system ⇒ Body Work ⇒ Rep. gr. 50 .
- Place a catch pan - VAS 6208- under the radiator.



Note

- ◆ Connection diagram for coolant hoses:
- ◆ Vehicles Octavia II, Superb II and Yeti
⇒ "1.1.1 Connection diagram - coolant hoses (Octavia II, Superb II and Yeti)", page 150 .
- ◆ Vehicles Rapid NH
⇒ "1.1.2 Connection diagram - coolant hoses (Rapid NH)", page 152 .
- ◆ Depending on the components which must be removed, the coolant from the cooling system, from the charge air cooling system coolant circuit or from both cooling systems must be drained.
- ◆ If the coolant must be replaced, it should be drained from both cooling systems.



Drain the coolant from the cooling system

For vehicles Octavia II, Superb II, Yeti

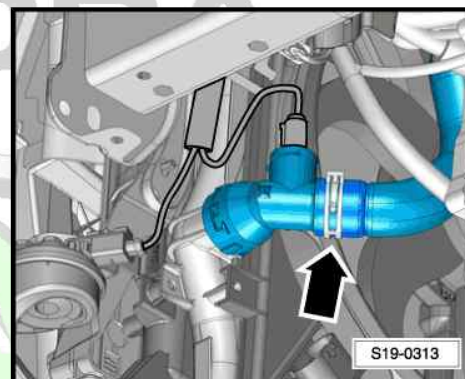
- Open spring clip -arrow-, remove bottom coolant hose from radiator and allow coolant to drain.
If the quick coupling is pulled off the lower radiator supports a large quantity of coolant runs onto the bumper cover.



Note

Observe all the disposal instructions!

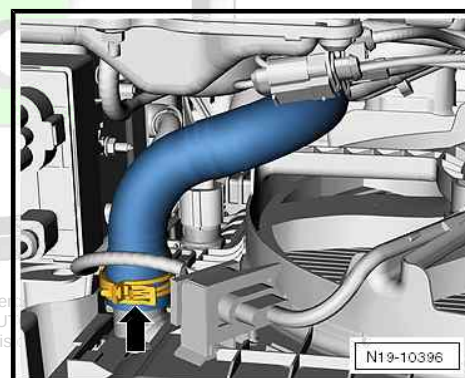
For vehicles Rapid NH



- Open spring clip -arrow-, remove bottom coolant hose from radiator and allow coolant to drain.

Drain coolant from the charge air system coolant circuit

For vehicles Octavia II, Superb II, Yeti



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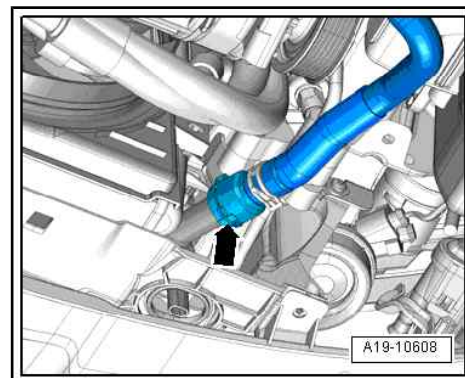
- Release quick-release coupling -arrow- and remove bottom coolant hose from charge air cooling circuit radiator.



Note

Observe all the disposal instructions!

For vehicles Rapid NH



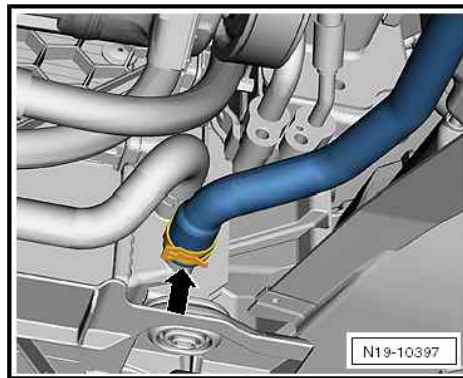


- Open spring strap clip -arrow- and pull bottom coolant hose off charge air cooler.

Top up and bleed cooling system.

Select the appropriate coolant additive from the ➔ ETKA - Electronic catalogue of original parts .

- In a clean reservoir, mix distilled water and coolant additive in the specified mixing ratio:
 - ◆ ➔ Maintenance ; Booklet Octavia II .
 - ◆ ➔ Maintenance ; Booklet Superb II .
 - ◆ ➔ Maintenance ; Booklet Yeti .
 - ◆ ➔ Maintenance ; Booklet Rapid NH .



Caution

Only mix coolant additive with distilled water. You must not use drinking water.

- Reposition the removed coolant hose onto the relevant support.
- Install the noise insulation ➔ Body Work; Rep. gr. 50 .
- Switch off the air-conditioning system and the heating.

With cooling system charge unit - VAS 6096-

- Screw adapter for cooling system tester - V.A.G 1274/8- onto expansion tank.
- Fill coolant circuit using cooling system charge unit - VAS 6096- ➔ Operating instructions for cooling system charge unit VAS 6096 .
- Fill coolant up to "Max." marking on the expansion reservoir.

Without cooling system charge unit - VAS 6096-



Caution

In order to secure the refrigerating capacity of the charge air cooling system, the following work steps must absolutely be observed.

- Fill new coolant slowly up to the top marking of the criss-crossed field ("max.") on the expansion reservoir.
- Fit cooling system tester - V.A.G 1274B- onto expansion tank and apply a pressure of 0.15 MPa (1.5 bar) to cooling system.



Note

Activating the cooling system with pressure will eliminate any air bubbles.

- Fill coolant up to “Max.” marking on the expansion reservoir, if necessary.
- Fit expansion tank cap.

Vehicles without auxiliary heating.

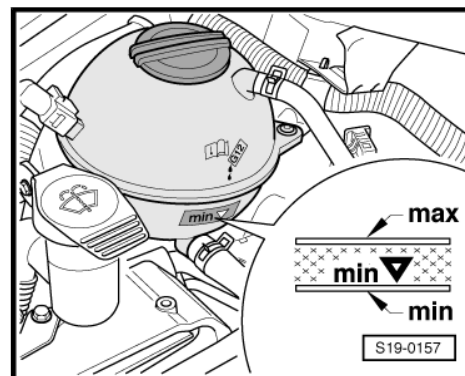
- Start the engine and maintain the engine speed for about 3 minutes at approx. 2000 rpm.
- Run engine until radiator fan - V7- starts.

Vehicles with auxiliary heating.



Caution

The auxiliary heating must only be switched on, if the refrigerant circuit is filled up -as described below-.



- Connect ⇒ Vehicle diagnostic tester.
- Start the engine and maintain the engine revolutions for about 3 minutes at about 2000 rpm.
- On the display press consecutively the buttons for “Vehicle self-diagnosis”, “18 - Auxiliary heating system” and “03 - Actuator diagnosis”.
- Press the right arrow on the display so often until the coolant shut-off valve of heating system - N279- is shown.
- Perform self-diagnosis of the coolant shut-off valve of heating system -N279- and maintain the engine speed at approx. 2000 rpm for about 1 minute.

Continued for all vehicles



WARNING

Hot steam may escape when the compensation bottle is opened. Wear safety goggles and safety clothing, in order to avoid eye injuries and scalding. Cover the cap with a cloth and open carefully.

- Inspect coolant level, top up with coolant if necessary. When engine is at operating temperature the coolant level must be at the “max” marking, when engine is cold between the “min” and “max” markings.

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2 Coolant pump, regulation of cooling system

⇒ [“2.1 Assembly overview - coolant pump”, page 160](#)

⇒ [“2.2 Assembly overview - thermostat”, page 161](#)

⇒ [“2.3 Removing and installing electric coolant pump”, page 162](#)

⇒ [“2.4 Removing and installing coolant pump”, page 162](#)

⇒ [“2.5 Removing and installing belt pulley for coolant pump”, page 163](#)

2.1 Assembly overview - coolant pump

1 - Coolant hose

2 - Screw

□ 8 Nm

3 - Coolant recirculation pump - V50-

□ removing and installing
⇒ [“2.3.1 Removing and installing coolant recirculation pump V50”, page 162](#)

4 - Coolant hose

5 - Support

6 - Coolant pump

□ removing and installing
⇒ [“2.4 Removing and installing coolant pump”, page 162](#)
□ with integrated gasket ring

7 - Screw

□ 9 Nm

8 - Screw

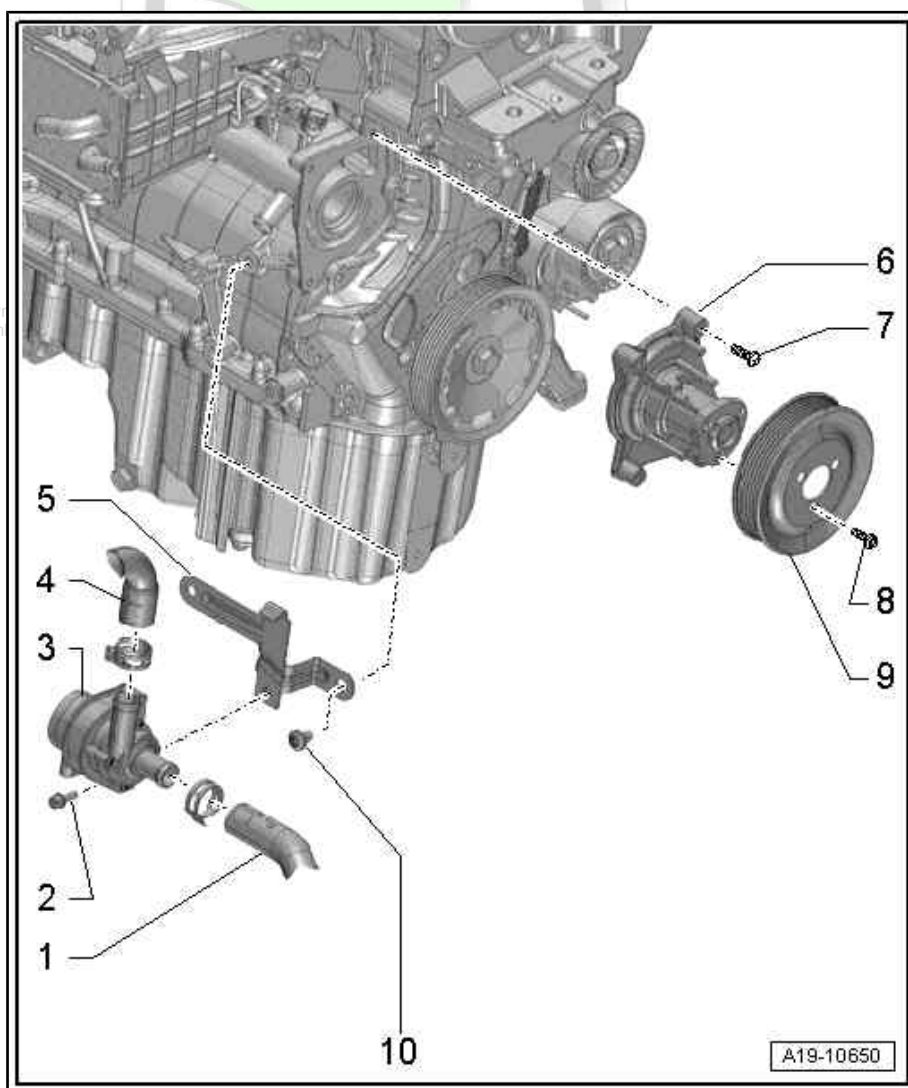
□ 20 Nm

9 - Belt pulley for coolant pump

□ removing and installing
⇒ [“2.5 Removing and installing belt pulley for coolant pump”, page 163](#)

10 - Screw

□ 20 Nm



2.2 Assembly overview - thermostat

1 - Screw

- 5 Nm

2 - Connection fittings

3 - Screw

- 5 Nm

4 - Connection fittings

5 - O-ring

- Replace after disassembly

6 - Pressure spring

7 - Tappet

- Do not cant when installing.

8 - Thermocouple for thermostat 105 °C

- do not interchange with Pos. -18-
- Control range: 105 ... 120 °C
- Opening stroke: at least 8 mm

9 - Clamp

- check tightness

10 - Coolant temperature sender - G62-

- Before removing, release pressure in cooling system if necessary.

11 - O-ring

- Replace after disassembly

12 - Screw

- Replace after disassembly
- 11 Nm

13 - Thermostat housing

14 - Gasket

- Replace after disassembly

15 - O-ring

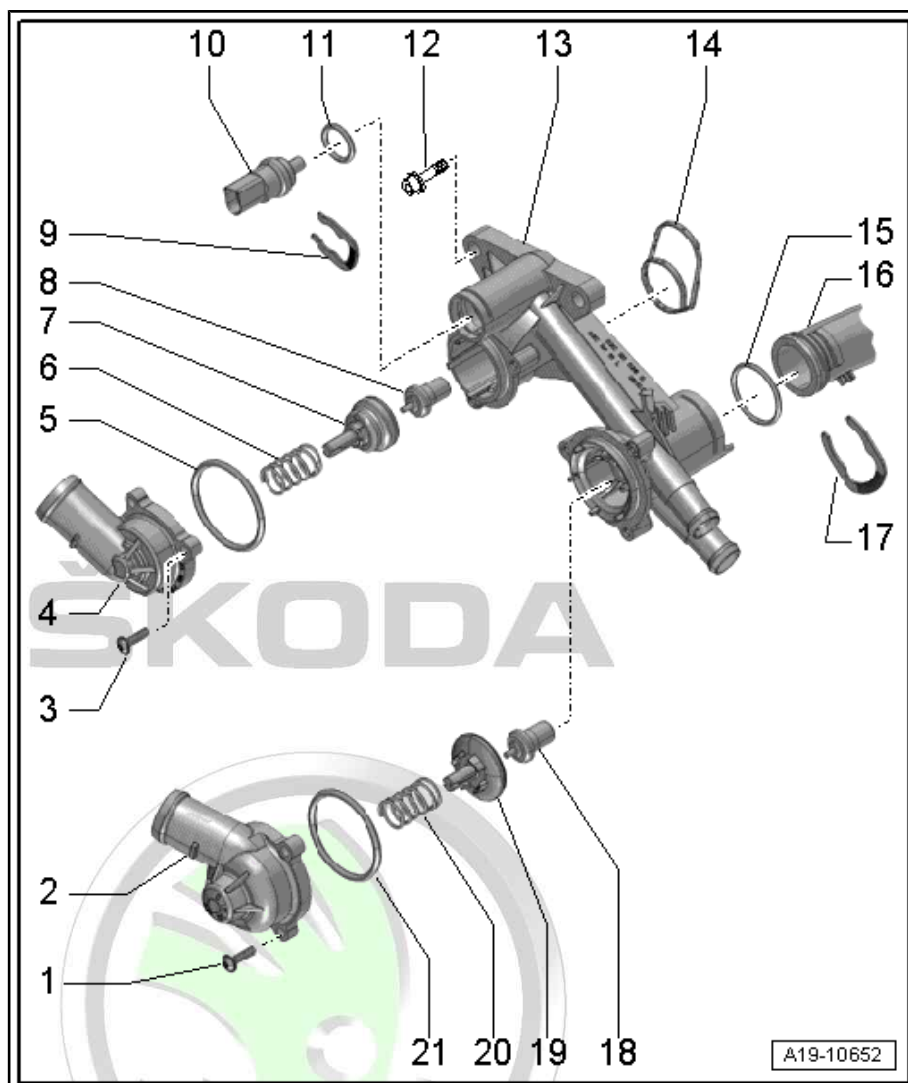
- Replace after disassembly

16 - Coolant pipe

17 - Retaining clip for coolant pipe

18 - Thermocouple for thermostat 83 °C

- do not interchange with Pos. -8-
- Control range: 83... 98 °C
- Opening stroke: at least 8 mm



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19 - Tappet

- ☐ Do not cant when installing.

20 - Pressure spring

21 - O-ring

- ☐ Replace after disassembly

2.3 Removing and installing electric coolant pump

⇒ [“2.3.1 Removing and installing coolant recirculation pump V50”](#), page 162

2.3.1 Removing and installing coolant recirculation pump - V50-

Special tools and workshop equipment required

- ◆ Hose clamps up to 25 mm - MP 7-602 (3094)-
- ◆ Pliers for spring strap clips , e.g. -VAS 6340-
- ◆ Catch pan , e.g. -VAS 6208-

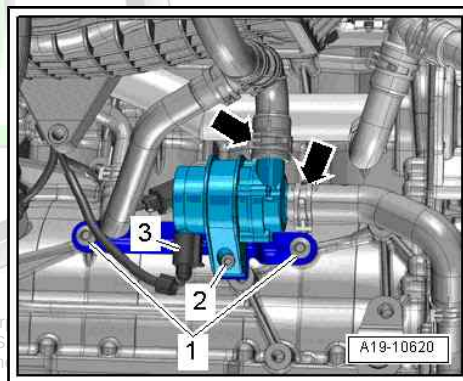
Removing

- Remove the sound dampening system ⇒ Body Work; Rep. gr. 50 .
- Disconnect plug connection -3-.
- Release screw -2- and remove coolant recirculation pump - V50- .
- Place a catch pan - VAS 6208- under the engine.
- Pinch off the coolant hoses with the hose clamps - MP 7-602- and detach them from the coolant recirculation pump - V50- .

Install

Installation is performed in the reverse order, pay attention to the following points:

- Inspect coolant level, if necessary top up cooling system and bleed ⇒ [“1.3 Draining and filling coolant”](#), page 155 .



Tightening torques

- ◆ ⇒ [“2.1 Assembly overview - coolant pump”](#), page 160
- ◆ Noise insulation ⇒ Body Work- Assembly; Rep. gr. 50

2.4 Removing and installing coolant pump

Special tools and workshop equipment required

- ◆ Catch pan , e.g. -VAS 6208-

Removing



Note

- ◆ *The integrated gasket of the coolant pump must not be separated from the coolant pump.*
- ◆ *If damage and leak present, replace coolant pump with gasket completely.*

- Drain the coolant from the cooling system
⇒ [“1.3 Draining and filling coolant”, page 155](#) .
- Remove belt pulley for control pump
⇒ [“2.5 Removing and installing belt pulley for coolant pump”, page 163](#) .
- Release screws -arrows- and remove coolant pump.

Install

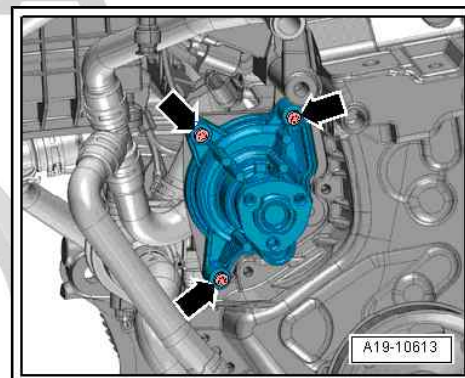
Installation is performed in the reverse order, pay attention to the following points:



Note

Renew O-ring.

- Clean and smooth O-ring sealing surfaces.
- Moisten O-ring with coolant.
- Install belt pulley for coolant pump
⇒ [“2.5 Removing and installing belt pulley for coolant pump”, page 163](#) .
- Top up and bleed cooling system
⇒ [“1.3 Draining and filling coolant”, page 155](#) .



Tightening torques

- ♦ ⇒ [“2.1 Assembly overview - coolant pump”, page 160](#)

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2.5 Removing and installing belt pulley for coolant pump

Special tools and workshop equipment required

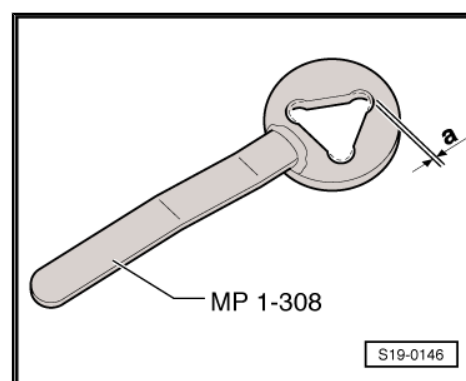
- ♦ Wrench for the water pump and power-assisted steering - MP 1-308 (V.A.G 1590)-

Converting wrench for the water pump and power-assisted steering - MP 1-308-

- Because of changes to the belt pulley fixing screws for the coolant pump curves, larger curves must be filed on the wrench.
- a- at least 1 mm

Removing

- Remove V-ribbed belt
⇒ [“1.3 Removing and installing V-ribbed belt”, page 54](#) .



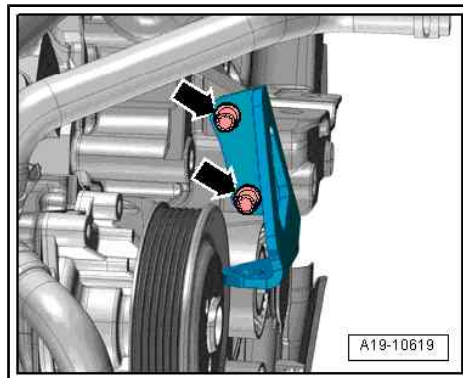


- Release screws -arrows- and remove holder from timing case.



Note

The bracket at the timing case only serves as transport security of the engine before the first installation and must not be refitted.



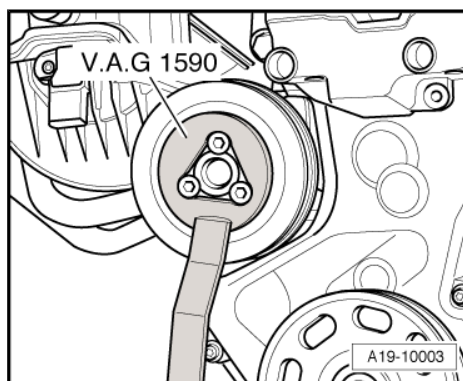
- Release the screws for the belt pulley for coolant pump, to do so counterhold with wrench for the water pump and power-assisted steering - V.A.G 1590- .

Install

Installation is carried out in the reverse order.

Tightening torques

- ♦ ⇒ [“2.1 Assembly overview - coolant pump”, page 160](#)



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3 Coolers, radiator, radiator fan

⇒ [“3.1 Assembly overview - radiator/radiator fan”, page 165](#)

⇒ [“3.2 Removing and installing radiator”, page 169](#)

⇒ [“3.3 Removing and installing charge air cooling circuit radiator \(Octavia II, Superb II, Yeti\)”, page 172](#)

⇒ [“3.4 Removing and installing radiator cowling with radiator fan”, page 174](#)

⇒ [“3.5 Removing and installing radiator fan V7 ”, page 176](#)

3.1 Assembly overview - radiator/radiator fan

⇒ [“3.1.1 Summary of components - radiator/radiator fan \(Octavia II, Superb II and Yeti\)”, page 165](#)

⇒ [“3.1.2 Summary of components - radiator/radiator fan \(Rapid NH\)”, page 167](#)

3.1.1 Summary of components - radiator/radiator fan (Octavia II, Superb II and Yeti)



Note

This engine is fitted with a radiator for the charge air circuit

⇒ [“2.1.1 Summary of components - charge air system \(Octavia II, Superb II and Yeti\)”, page 255](#) .

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1 - Radiator

- ❑ removing and installing
⇒ “3.2 Removing and installing radiator”, page 169
- ❑ After replacing, renew entire coolant
⇒ “1.3 Draining and filling coolant”, page 155

2 - O-ring

- ❑ replace if damaged

3 - Top coolant hose

- ❑ To connection fitting at cylinder head
- ❑ connection diagram for coolant hoses
⇒ "1.1.1 Connection diagram - coolant hoses (Octavia II, Superb II and Yeti)", page 150

4 - Coolant hose

- to the expansion reservoir

5 - Spring strap clamp

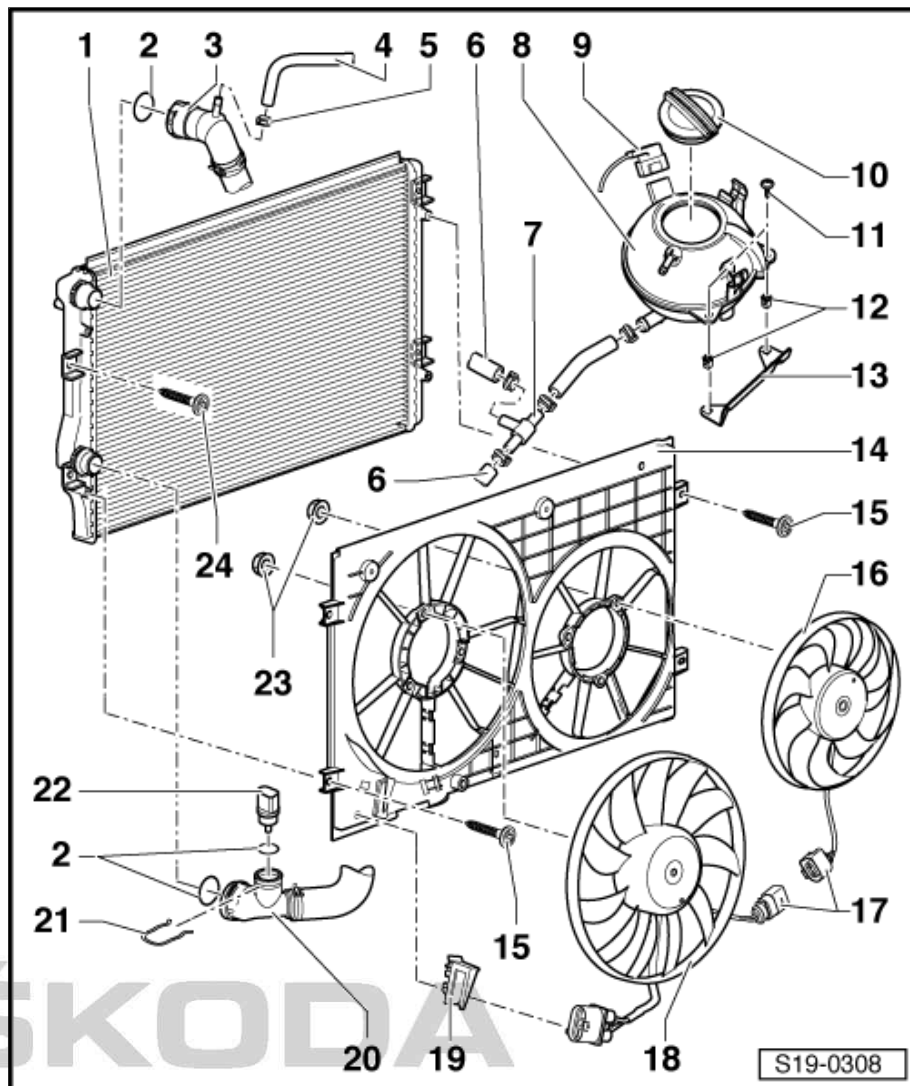
6 - Coolant hose

- to coolant pipe for charge air cooling circuit

7 - Connecting pipe

8 - Expansion reservoir

- ❑ with coolant shortage warning light sender - G32-
- ❑ Check the cooling system for tightness ⇒ "1.2



9 - Connector

10 - Screw cap

- ❑ Testing the pressure relief valve in the cap
⇒ “1.2 Checking the coolant system for leaktightness”, page 153

11 - Screw

- ☐ 3 Nm

12 - Plastic inserts

- for fixing screws

13 - Support

14 - Fan shroud

- ❑ removing and installing
⇒ “3.4.1 Removing and installing fan shroud with radiator fan (Octavia II, Superb II, Yeti)”, page 174

15 - Screw

- 5 Nm

16 - Right radiator fan - V35

- ❑ removing and installing
⇒ “3.5.1 Removing and installing radiator fan V7 and V35 (Octavia II, Superb II, Yeti)”, page 176

17 - Connector

18 - Radiator fan - V7-

- ☐ removing and installing

⇒ [“3.5.1 Removing and installing radiator fan V7 and V35 \(Octavia II, Superb II, Yeti\)”, page 176](#)

19 - Support

- ☐ for plug

20 - Bottom coolant hose

- ☐ to connection fitting for thermostat

21 - Clamp

- ☐ check tightness

22 - Coolant temperature sender at radiator outlet - G83-

23 - Nut

- ☐ 5 Nm

24 - Screw

- ☐ Secure charge air cooling circuit radiator

⇒ [“2.1.1 Summary of components - charge air system \(Octavia II, Superb II and Yeti\)”, page 255](#)

- ☐ 5 Nm

3.1.2 Summary of components - radiator/radiator fan (Rapid NH)



Note

- ◆ *The radiator and the charge air cooler are separate parts.*
- ◆ *The radiator is fitted onto the charge air cooler.*
- ◆ *The radiator and the charge air cooler are removed and installed together.*

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1 - Radiator

- ☐ removing and installing
⇒ [“3.2 Removing and installing radiator”, page 169](#)
- ☐ After replacing, renew entire coolant
⇒ [“1.3 Draining and filling coolant”, page 155](#)

2 - Coolant hose

- ☐ to exhaust gas turbo-charger

3 - Coolant hose

- ☐ to charge-air cooler

4 - Coolant hose

- ☐ to exhaust gas turbo-charger

5 - Coolant hose

- ☐ to charge-air cooler in the intake manifold

6 - The fan ring

7 - Coolant hose

- ☐ to coolant pipe below the intake manifold

8 - Coolant hose

- ☐ to engine oil cooler

9 - Expansion reservoir

- ☐ with coolant shortage warning light sender - G32

- ☐ Check the cooling system for tightness

⇒ [“1.2 Checking the coolant system for leaktightness”, page 153](#)

10 - Connector

11 - Screw cap

- ☐ Testing the pressure relief valve in the cap

⇒ [“1.2 Checking the coolant system for leaktightness”, page 153](#)

12 - Screw

- ☐ 5 Nm

13 - Plastic inserts

- ☐ for fixing screws

14 - Support

15 - Coolant hose

- ☐ to coolant recirculation pump - V50-

16 - Radiator fan - V7-

- ☐ removing and installing ⇒ [“3.5.2 Removing and installing the radiator fan V7 \(Rapid NH\)”, page 177](#)

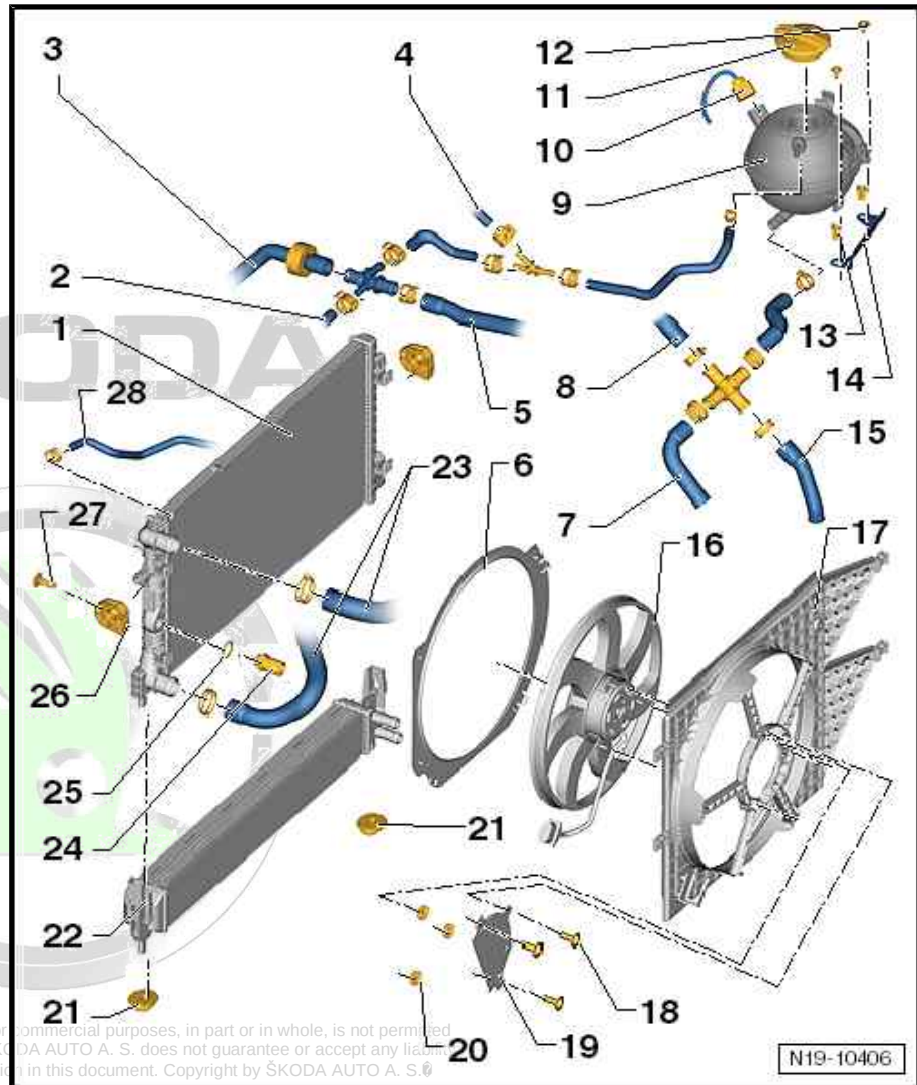
17 - Fan shroud

- ☐ removing and installing

⇒ [“3.4.2 Removing and installing fan shroud with radiator fan \(Rapid NH\)”, page 175](#)

18 - Screw

- ☐ mounted up to 05.2010



- ☐ 2 Nm
- 19 - Heat shield**
 - ☐ mounted up to 05.2010
- 20 - Nut**
 - ☐ 8 Nm
- 21 - Bottom radiator bearing**
- 22 - Charge air cooler**
 - ☐ removing and installing ⇒ [“3.2 Removing and installing radiator”, page 169](#)
- 23 - Coolant hose**
 - ☐ to the thermostat housing
- 24 - Coolant temperature sender at radiator outlet - G83-**
- 25 - O-ring**
 - ☐ replace if damaged
- 26 - Top radiator bearing**
- 27 - Screw**
 - ☐ 5 Nm
- 28 - Coolant hose**
 - ☐ to the expansion reservoir

3.2 Removing and installing radiator

⇒ [“3.2.1 Removing and installing radiator \(Octavia II, Superb II and Yeti\)”, page 169](#)

⇒ [“3.2.2 Removing and installing the radiator with charge air cooler \(Rapid NH\)”, page 170](#)

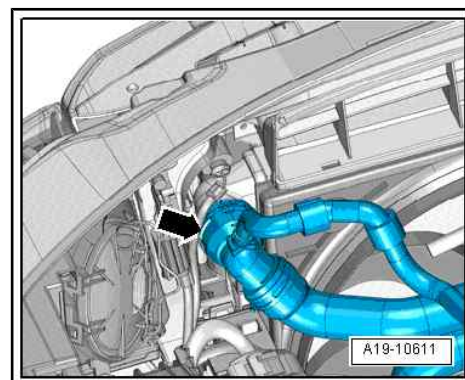
3.2.1 Removing and installing radiator (Octavia II, Superb II and Yeti)

Special tools and workshop equipment required

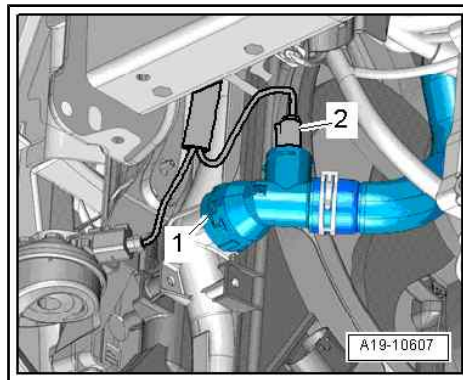
- ◆ Catch pan , e.g. -VAS 6208-
- ◆ Pliers for spring strap clips , e.g. -VAS 6340-

Removing

- Drain the coolant from the cooling system
⇒ [“1.3 Draining and filling coolant”, page 155](#) .
- Removing fan shroud
⇒ [“3.4.1 Removing and installing fan shroud with radiator fan \(Octavia II, Superb II, Yeti\)”, page 174](#) .
- Remove top left coolant fitting from radiator, to do so raise the retaining clip -arrow-.



- Disconnect plug connection -2-.
- Detach the bottom coolant filler neck -1- from the radiator.



- Unscrew screws -arrows- and remove radiator downwards.

Install

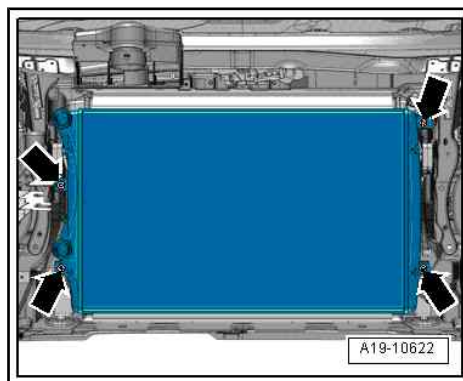


Caution

*Replace all the coolant when installing the new cooler
⇒ "1.3 Draining and filling coolant", page 155 .*

Installation is performed in the reverse order, pay attention to the following points:

- Top up and bleed cooling system
⇒ "1.3 Draining and filling coolant", page 155 .



Tightening torques

- ♦ ⇒ "3.1.1 Summary of components - radiator/radiator fan (Octavia II, Superb II and Yeti)", page 165

3.2.2 Removing and installing the radiator with charge air cooler (Rapid NH)

Special tools and workshop equipment required

- ♦ Catch pan , e.g. -VAS 6208-
- ♦ Pliers for spring strap clips , e.g. -VAS 6340-

Removing

- Remove front bumper ⇒ Body Work; Rep. gr. 63 .
- Drain coolant ⇒ "1.3 Draining and filling coolant", page 155 .
- Removing fan shroud
⇒ "3.4.2 Removing and installing fan shroud with radiator fan (Rapid NH)", page 175 .
- Disconnect plug from coolant temperature sender at radiator outlet - G83- .
- Detach top coolant hose from connection fitting of coolant radiator.
- Detach top coolant hose from connection fitting of charge air cooler.
- Unscrew fixing screws for radiator bearing on the top right and left.
- Press radiator backwards and remove radiator brackets, top left and right.

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Vehicles without air conditioning system

- Push the radiator together with the charge air cooler upwards out of the bottom rubber bearings and remove it laterally down.

Vehicles with air conditioning

- Remove V-ribbed belt
⇒ ["1.3 Removing and installing V-ribbed belt", page 54](#) .



WARNING

Risk of injury through refrigerant.

- ◆ *Do not open the refrigerant circuit of the air conditioning system.*

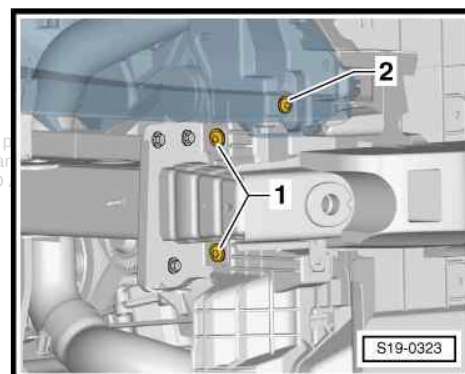


Caution

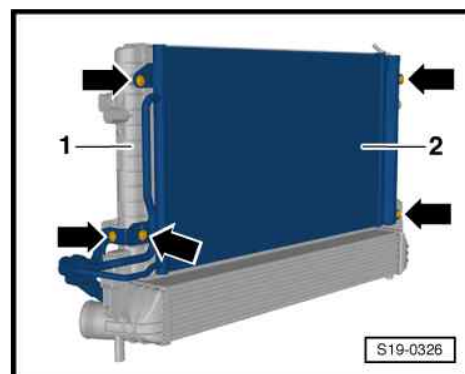
Risk of damaging the condenser as well as the refrigerant lines and hoses.

- ◆ *Do not over-tension or buckle refrigerant lines and hoses.*

- Remove the AC compressor from the bracket for auxiliary units and secure it with connected refrigerant hoses to the body.
- Mark the installation position of the screws -1- on the right and left and only slacken them.
- Push the radiator together with the charge air cooler and the condensor upwards out of the lower rubber bearings.
To do so, pull the plastic housing of the lock carrier downwards. There is very little space on the right between the refrigerant line and the body.
- Lay the radiator with the capacitor to the rear.



- Release the screws -arrows- of the condensor -2- from the radiator -1-.
- Draw the condensor forwards and attach to the lock carrier.
- Remove the radiator together with the charge air cooler laterally down.



Continued for all vehicles



- Push the radiator -1- in -direction of arrow- out of the lateral brackets on the charge-air cooler -2-.

Install



Caution

*Replace all the coolant when installing the new cooler
⇒ ["1.3 Draining and filling coolant", page 155](#) .*

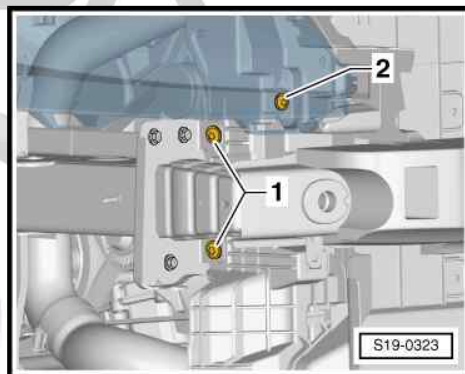
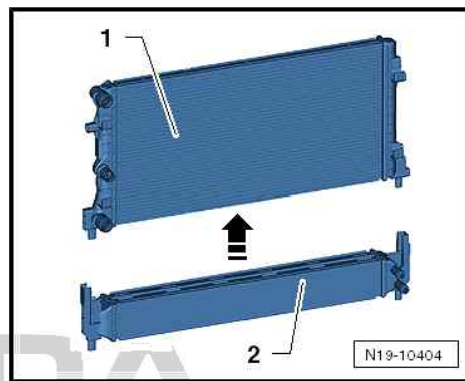
Installation is performed in the reverse order, pay attention to the following points:

- On vehicles with air conditioning system, push the plastic housing of the lock carrier upwards into the initial position and tighten the screws -1- on the right and left.
- Top up coolant
⇒ ["1.3 Draining and filling coolant", page 155](#) .

Tightening torques

- ♦ ⇒ ["3.1.2 Summary of components - radiator/radiator fan \(Rapid NH\)", page 167](#)
- ♦ AC compressor ⇒ Heating, Air Conditioning; Rep. gr. 87
- ♦ Removing front bumper ⇒ Body Work; Rep. gr. 63

Component	Specified torque
Screws for plastic housing of the lock carrier	8 Nm



3.3 Removing and installing charge air cooling circuit radiator (Octavia II, Superb II, Yeti)

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Removing

- Drain the coolant from the cooling system and the charge air cooling system
⇒ ["1.3 Draining and filling coolant", page 155](#) .

- Release quick-release coupling -arrow- and remove top coolant hose from charge air cooling circuit radiator.
- Removing radiator
⇒ [“3.2 Removing and installing radiator”, page 169](#) .
- Remove front bumper ⇒ Body Work; Rep. gr. 63 .

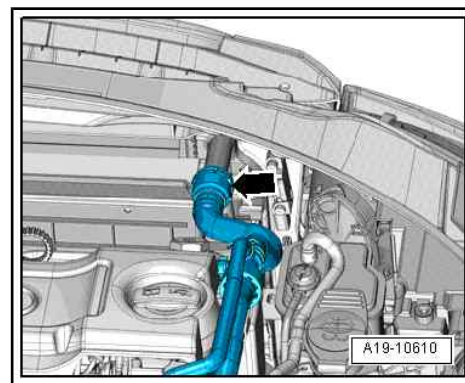
For vehicles Octavia II and Yeti

For vehicles with air conditioning



WARNING

Do not open the refrigerant circuit of the air conditioning system.



Caution

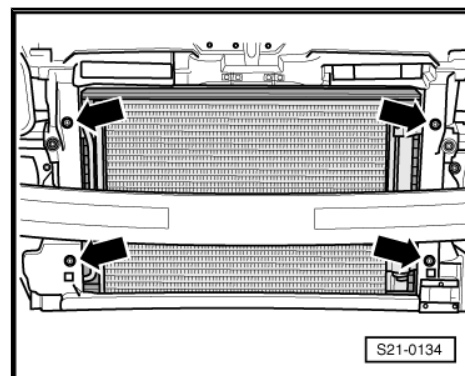
In order to avoid damage to the condenser as well as to the refrigerant lines and hoses, ensure that the lines and hoses are not over-tensioned, kinked or bent.

- Release the securing bolts -arrows- of the condenser.

For all vehicles

- Unscrew fixing screws for charge air cooling circuit radiator on right and left ⇒ [Item 26 \(page 257\)](#) .

For vehicles with air conditioning

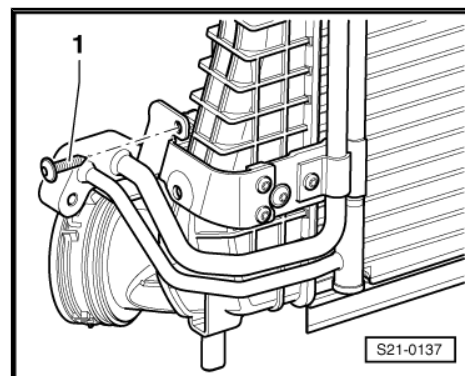


- Press off the charge air cooling circuit radiator from the lock carrier with the assistance of a 2nd mechanic so that the fixing screw -1- for the coolant lines on the radiator is accessible.
- Remove screw -1-.

For all vehicles

- Carefully remove charge air cooling circuit radiator downwards.

For vehicles Superb II



- Unscrew screws -1- on charge air cooling circuit radiator.



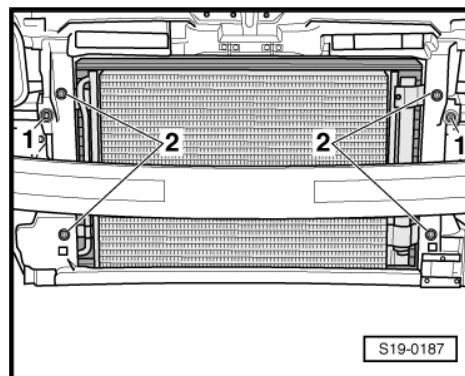
WARNING

Do not open the refrigerant circuit of the air conditioning system.



Caution

In order to avoid damage to the condenser as well as to the refrigerant lines and hoses, ensure that the lines and hoses are not over-tensioned, kinked or bent.



- With the assistance of the 2nd mechanic, swivel the charge air cooling circuit radiator backwards, remove the brackets at the sides and unhook the brackets at the bottom.
- Release the securing bolts -arrows- of the condenser.
- Remove charge air cooling circuit radiator downwards.

For all vehicles

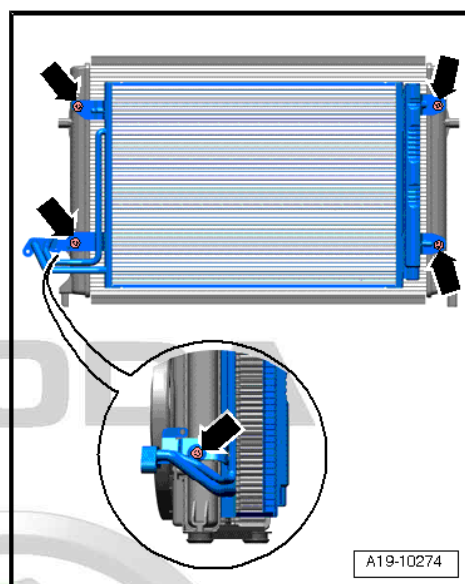
Install

Installation is carried out in the reverse order. When installing, note the following:

- Top up and bleed cooling system
⇒ [“1.3 Draining and filling coolant”, page 155](#) .

Tightening torques

- ♦ ⇒ [“3.1.1 Summary of components - radiator/radiator fan \(Octavia II, Superb II and Yeti\)”, page 165](#)
- ♦ ⇒ [“2.1.1 Summary of components - charge air system \(Octavia II, Superb II and Yeti\)”, page 255](#)



3.4 Removing and installing radiator cowl- ing with radiator fan

⇒ [“3.4.1 Removing and installing fan shroud with radiator fan \(Octavia II, Superb II, Yeti\)”, page 174](#)

⇒ [“3.4.2 Removing and installing fan shroud with radiator fan \(Rapid NH\)”, page 175](#)

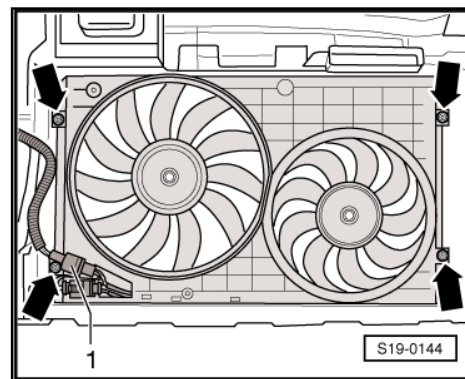
3.4.1 Removing and installing fan shroud with radiator fan (Octavia II, Superb II, Yeti)

Removing

- Remove air filter housing
⇒ [“3.2.1 Removing and installing air filter housing \(Octavia II, Superb II, Yeti\)”, page 277](#) .

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- Unscrew the top fixing screws of the fan shroud -arrows-.
- Remove the sound dampening system ⇒ Body Work; Rep. gr. 50 .



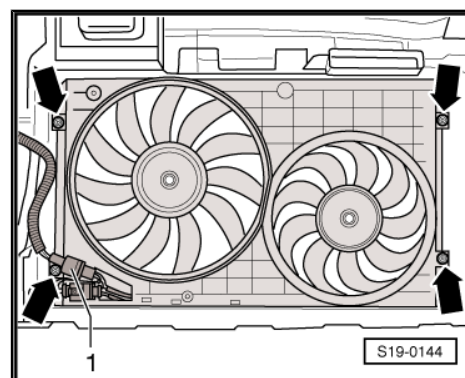
- Disconnect the plug connection -1- and unscrew the bottom fixing screws of the fan shroud -arrows-.
- Remove fan shroud downwards.

Install

Installation is carried out in the reverse order.

Tightening torques

- ♦ ⇒ [“3.1.1 Summary of components - radiator/radiator fan \(Octavia II, Superb II and Yeti\)”, page 165](#)
- ♦ Noise insulation ⇒ Body Work- Assembly; Rep. gr. 50



3.4.2 Removing and installing fan shroud with radiator fan (Rapid NH)

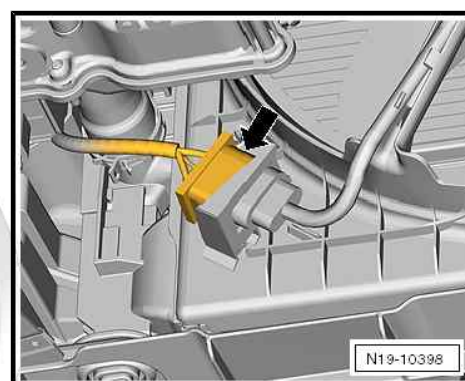


Note

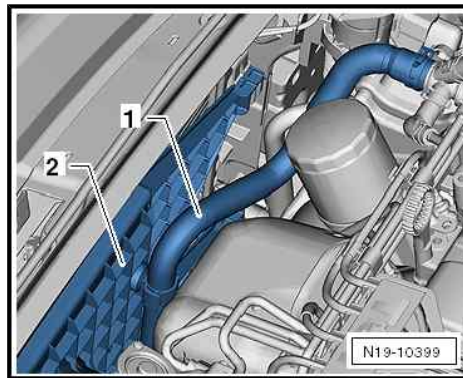
Various versions of the fan shroud are installed ⇒ ETKA - Electronic Catalogue of Original Parts .

Removing

- Remove the sound dampening system ⇒ Body Work; Rep. gr. 50 .
- Disconnect plug connection -arrow-.



- Open the retaining clips of the coolant hose -1- at the fan shroud -2-.



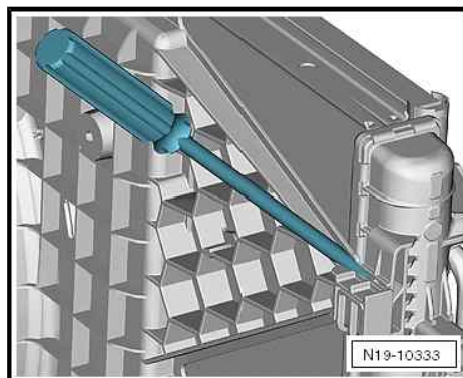
- Release the support for the top right as well as left fan shroud and lift the fan shroud out of the supports.
- Remove fan shroud downwards.

Install

Installation is carried out in the reverse order.

Tightening torques

- ♦ ⇒ [“3.1.2 Summary of components - radiator/radiator fan \(Rapid NH\)”, page 167](#)
- ♦ Noise insulation ⇒ Body Work- Assembly; Rep. gr. 50



3.5 Removing and installing radiator fan - V7-

⇒ [“3.5.1 Removing and installing radiator fan V7 and V35 \(Octavia II, Superb II, Yeti\)”, page 176](#)

⇒ [“3.5.2 Removing and installing the radiator fan V7 \(Rapid NH\)”, page 177](#)

3.5.1 Removing and installing radiator fan - V7- and -V35- (Octavia II, Superb II, Yeti)

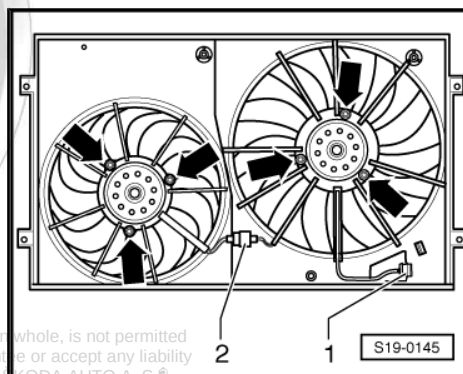
- Removing fan shroud
⇒ [“3.4.1 Removing and installing fan shroud with radiator fan \(Octavia II, Superb II, Yeti\)”, page 174](#) .
- Disconnect the plug connection -2- and expose cable.
- Disconnect the plug connection -1- from the fan shroud and expose cable.
- Unscrew screws -arrows- and remove the fan.

Install

Installation is carried out in the reverse order.

Tightening torques

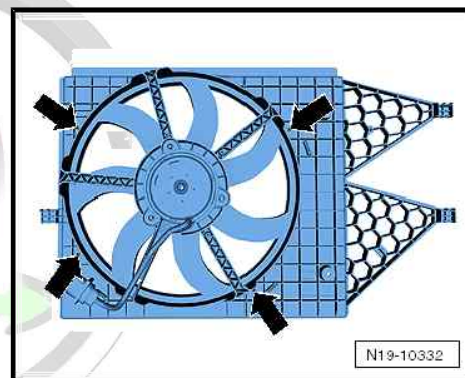
- ♦ ⇒ [“3.1.1 Summary of components - radiator/radiator fan \(Octavia II, Superb II and Yeti\)”, page 165](#)



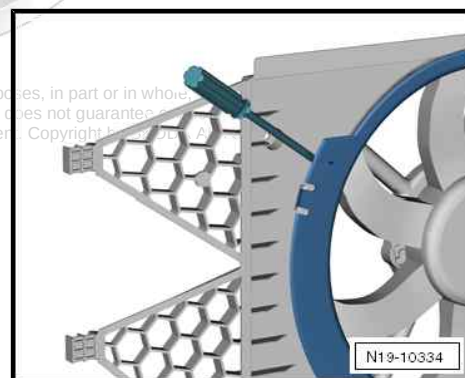
3.5.2 Removing and installing the radiator fan - V7- (Rapid NH)

Removing

- Removing fan shroud
⇒ [“3.4.2 Removing and installing fan shroud with radiator fan \(Rapid NH\)”, page 175](#) .
- Unlock electric harness for the fan from the fan shroud.
- Push the pins of spreader rivets -arrows- back and undo the expanding rivets.



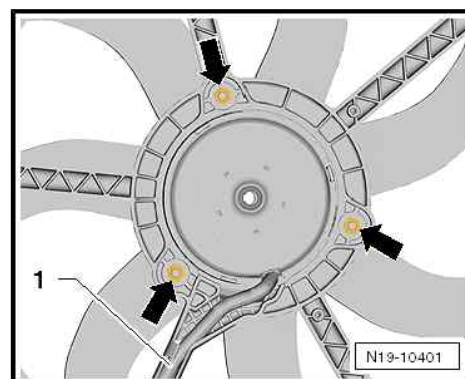
- Carefully raise the fan ring on the reverse side of the fan shroud using a suitable tool.
- Remove fan ring.



- Remove the electric line -1- from the cable guide.
- Unscrew the nuts -arrows-.
- Remove radiator fan - V7- .

Install

Installation is performed in the reverse order, pay attention to the following points:

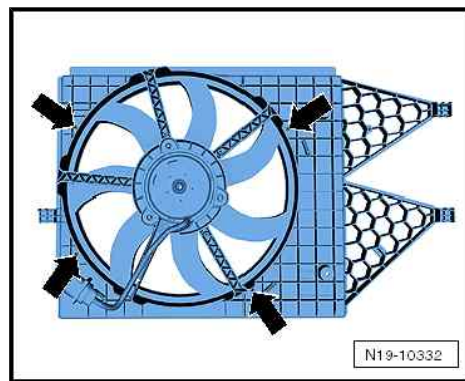




- Make sure the spreader rivets -arrows- are seated correctly.
- Install fan shroud
⇒ ["3.4.2 Removing and installing fan shroud with radiator fan \(Rapid NH\)", page 175](#) .

Tightening torques

- ♦ ⇒ ["3.1.2 Summary of components - radiator/radiator fan \(Rapid NH\)", page 167](#)



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20 – Fuel supply system

1 Fuel tank

⇒ [“1.1 Assembly overview - fuel tank”, page 179](#)

⇒ [“1.2 Drain the fuel tank”, page 185](#)

⇒ [“1.3 Removing and installing the fuel tank”, page 187](#)

1.1 Assembly overview - fuel tank

⇒ [“1.1.1 Summary of components - fuel tank \(Octavia II and Yeti\)”, page 179](#)

⇒ [“1.1.2 Summary of components - fuel tank \(Superb II\)”, page 181](#)

⇒ [“1.1.3 Summary of components - fuel tank \(Rapid NH\)”, page 183](#)

1.1.1 Summary of components - fuel tank (Octavia II and Yeti)

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1 - Mounting part

2 - Screw cap

- ☐ replace if damaged

3 - Earth connection

- ☐ check for firm seating

4 - Screw

- ☐ 11 Nm

5 - Guide

6 - Screw

- ☐ Replace after disassembly
- ☐ 25 Nm

7 - Fuel tank

- ☐ removing and installing
⇒ [“1.3.1 Removing and installing fuel tank \(Octavia II, Yeti\)”, page 187](#)

8 - Clamping system

- ☐ for heat shield

9 - Unbolt bracket for exhaust pipe

10 - Tensioning strap

- ☐ Check fitting position

11 - Heat shield

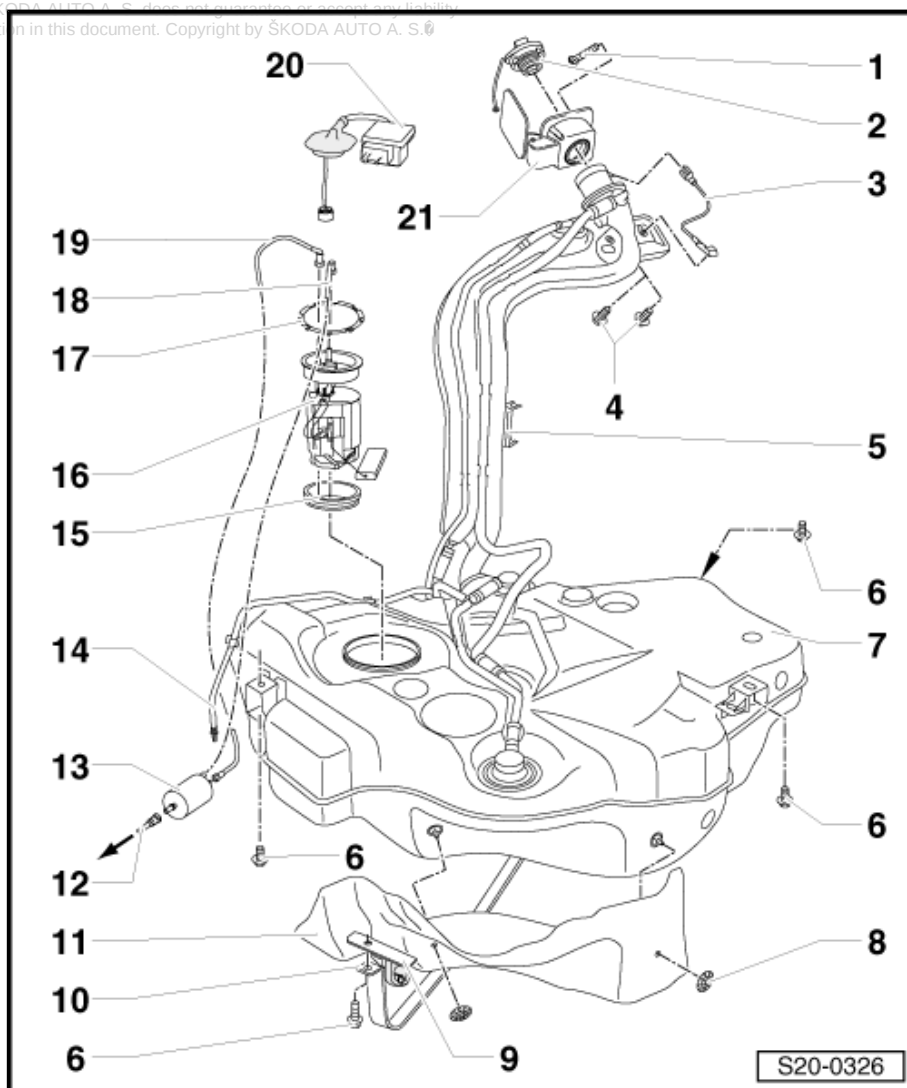
- ☐ for fuel tank

12 - Feed line

- ☐ to fuel rail
- ☐ check for firm seating

13 - Fuel filter

- ☐ with built-in fuel pressure sender





- ☐ Fitting position: arrow points in direction of flow
- ☐ Summary of components ⇒ [“4.1 Summary of components - fuel filter”, page 211](#)

14 - Vent line

- ☐ Clipped onto side of fuel tank.
- ☐ check for firm seating

15 - Sealing ring

- ☐ replace if damaged
- ☐ to be inserted dry into the opening of the fuel tank
- ☐ only moisten the inner seal of the flange with fuel for fitting purposes

16 - Fuel pump

- ☐ removing and installing
⇒ [“2.1.1 Removing and installing fuel delivery unit/fuel gauge sender \(Octavia II, Yeti\)”, page 195](#)
- ☐ inspecting fuel pump ⇒ [“7.1 Checking the fuel pump for predelivery system G6”, page 222](#)
- ☐ Fitting position of the flange of fuel delivery unit
⇒ [Fig. “Fitting location of the fuel delivery unit”, page 181](#)
- ☐ with sender for fuel gauge display - G-
- ☐ Removing and installing fuel gauge sender - G-
⇒ [“2.2 Removing and installing the sender for fuel gauge display G”, page 202](#) .
- ☐ Clean strainer if dirty

17 - Lock ring

- ☐ check for firm seating
- ☐ use wrench - T30101 (3087)- for removing and installing
- ☐ 110 Nm

18 - Feed line

- ☐ black
- ☐ Clipped onto side of fuel tank.
- ☐ check for firm seating

19 - Return-flow line

- ☐ blue
- ☐ Clipped onto side of fuel tank.
- ☐ check for firm seating

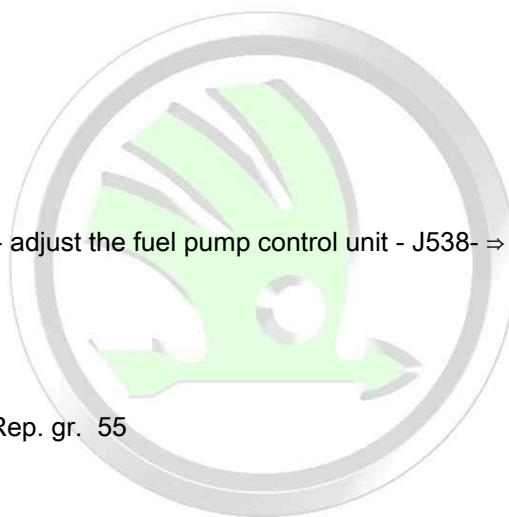
20 - Fuel pump control unit - J538-

- ☐ after replacing engine control unit - J623- adjust the fuel pump control unit - J538- ⇒ Vehicle diagnostic tester.
- ☐ check ⇒ Vehicle diagnostic tester

21 - Fuel tank lid unit

- ☐ with rubber bowl
- ☐ Removing and installing ⇒ Body Work; Rep. gr. 55

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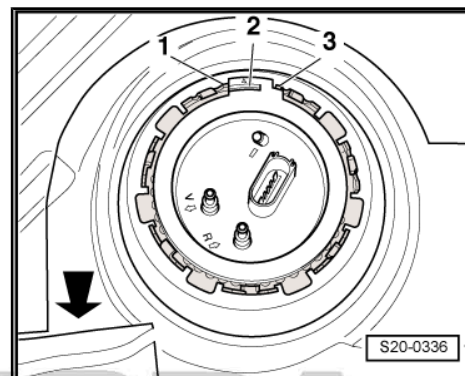
Fitting location of the fuel delivery unit

The peg -2- on the fuel delivery unit must be between the pegs -1- and -3-.



Note

- ◆ The -arrow- shows the direction of travel.
- ◆ The fuel delivery unit can only be installed in this position.



1.1.2 Summary of components - fuel tank (Superb II)

1 - Feed line

- ☐ black
- ☐ check for firm seating

2 - Return-flow line

- ☐ blue
- ☐ check for firm seating

3 - Sealing ring

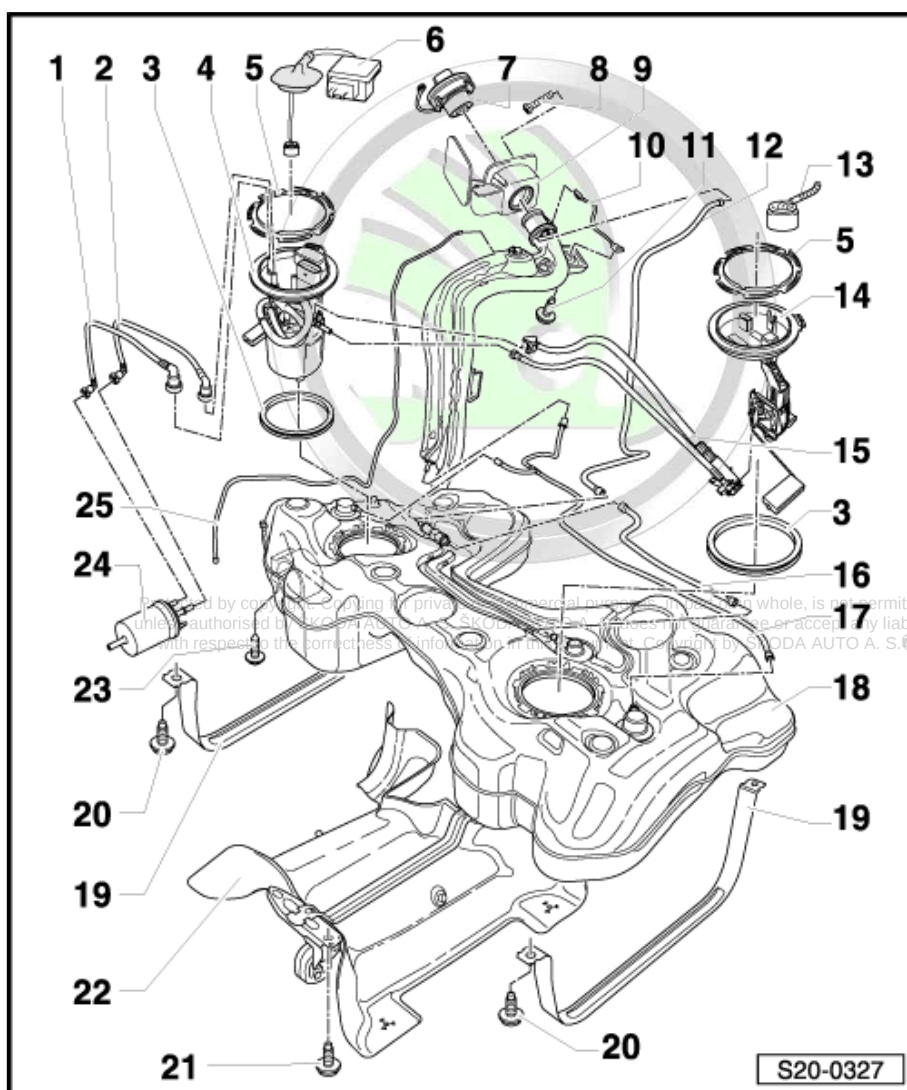
- ☐ replace
- ☐ to be inserted dry into the opening of the fuel tank
- ☐ only moisten the inner seal of the flange with fuel for fitting purposes

4 - Fuel pump

- ☐ removing and installing
⇒ ["2.1.2 Removing and installing fuel delivery unit/fuel gauge sender \(Superb II\)", page 197](#)
- ☐ inspecting fuel pump
⇒ ["7.1 Checking the fuel pump for predelivery system G6", page 222](#)
- ☐ Fitting position of the flange of fuel delivery unit
⇒ [Fig. "Installation position of the fuel delivery unit and the fuel gauge sender 2 -G169-", page 183](#)
- ☐ with sender for fuel gauge display - G-
- ☐ Removing and installing fuel gauge sender - G-
⇒ ["2.2 Removing and installing the sender for fuel gauge display G", page 202](#)
- ☐ Clean strainer if dirty
- ☐ after replacing engine control unit - J623- adjust the fuel pump control unit - J538- ⇒ Vehicle diagnostic tester.

5 - Lock ring

- ☐ check for firm seating
- ☐ use wrench - T30101 (3087)- for removing and installing





- ☐ 110 Nm

6 - Fuel pump control unit - J538-

- ☐ after replacing engine control unit - J623- adjust the fuel pump control unit - J538- ⇒ Vehicle diagnostic tester.

7 - Screw cap

- ☐ replace if damaged

8 - Screw

- ☐ Tightening torque ⇒ Body Work; Rep. gr. 55

9 - Fuel tank lid unit

- ☐ with rubber bowl
- ☐ Removing and installing ⇒ Body Work; Rep. gr. 55

10 - Earth connection

- ☐ check for firm seating

11 - Screw

- ☐ 11 Nm

12 - Tank ventilation

13 - Connector

- ☐ for fuel gauge sender 2 - G169-

14 - Fuel gauge sender 2 - G169-

- ☐ removing and installing ⇒ [“2.3 Removing and installing fuel gauge sender 2 G169”, page 204](#)

15 - Suction spray pump

- ☐ with fuel gauge sender 2 - G169- incorporated
- ☐ removing and installing ⇒ [“2.3 Removing and installing fuel gauge sender 2 G169”, page 204](#)

16 - Tank ventilation

17 - Vent line

18 - Fuel tank

- ☐ removing and installing ⇒ [“1.3.2 Removing and installing fuel tank \(Superb II\)”, page 189](#)

19 - Tensioning strap

- ☐ Check fitting position

20 - Screw

- ☐ Replace after disassembly
- ☐ 25 Nm

21 - Screw

- ☐ 23 Nm

22 - Heat shield

- ☐ riveted together with hanger of exhaust system

23 - Screw

- ☐ 3 Nm

24 - Fuel filter

- ☐ Fitting position: arrow points in direction of flow
- ☐ Summary of components ⇒ [“4.1 Summary of components - fuel filter”, page 211](#)

25 - Vent line

- ☐ Clipped onto side of fuel tank.
- ☐ check for firm seating

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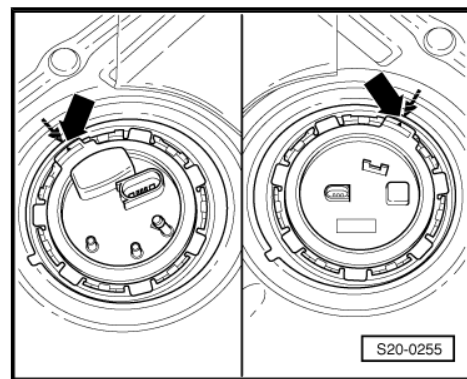
Installation position of the fuel delivery unit and the fuel gauge sender 2 - G169-

The marking on the flange must match the label on the fuel tank -arrows-.



Note

The arrows on the fuel tank are hardly visible due to the floor panel.



1.1.3 Summary of components - fuel tank (Rapid NH)

1 - Fuel tank

- ☐ removing and installing
⇒ [“1.3.3 Removing and installing the fuel tank \(Rapid NH\)”, page 192](#)

2 - Sealing ring

- ☐ replace
- ☐ to be inserted dry into the opening of the fuel tank
- ☐ only moisten the inner seal of the flange with fuel for fitting purposes

3 - Fuel pump

- ☐ removing and installing
⇒ [“2.1.3 Removing and installing the fuel delivery unit/fuel gauge sender \(Rapid NH\)”, page 200](#)
- ☐ inspecting fuel pump
⇒ [“7.1 Checking the fuel pump for predelivery system G6”, page 222](#)
- ☐ Fitting position of the flange of fuel delivery unit
⇒ [Fig. “Fitting location of the fuel delivery unit”, page 185](#)
- ☐ Clean strainer if dirty

4 - Union nut

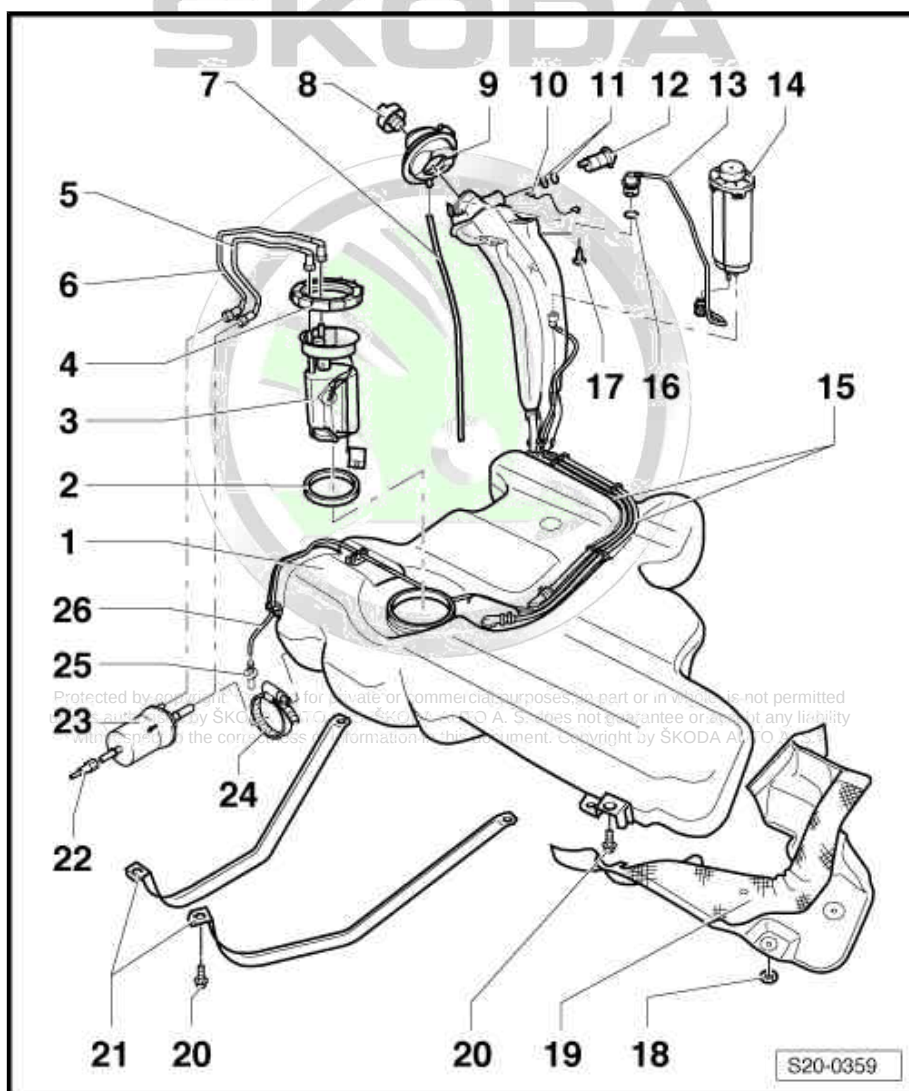
- ☐ slacken and tighten with wrench for union nut - MP 1-227 (3217)-

5 - Return-flow line

- ☐ from the fuel delivery unit to the fuel filter
- ☐ blue

6 - Feed line

- ☐ from fuel filter to fuel delivery unit
- ☐ black





7 - Overflow hose

8 - Screw cap

- ☐ replace if damaged

9 - Fuel tank lid unit

- ☐ with rubber bowl
- ☐ Removing and installing ⇒ Body Work; Rep. gr. 55

10 - Earth connection

- ☐ check for firm seating

11 - O-ring

- ☐ Replace after disassembly

12 - Vent valve

- ☐ checking ⇒ [Fig. "Inspect vent valve", page 185](#) .

13 - Gravity valve

- ☐ to remove, unclip valve and lift up and out of the filler neck
- ☐ inspect valve for blockage:
- ☐ Valve vertical: open
- ☐ Valve tilted 45°: closed

14 - Activated charcoal filter

- ☐ Summary of components
⇒ ["5.1.2 Summary of components - activated charcoal filter system \(Rapid NH\)", page 215](#)
- ☐ Checking the fuel tank venting ⇒ ["5.2 Checking the fuel tank venting", page 216](#)

15 - Vent line

16 - O-ring

- ☐ Replace after disassembly

17 - Screw

- ☐ 10 Nm

18 - Clamping system

- ☐ for heat shield

19 - Heat shield

- ☐ for fuel tank

20 - Screw

- ☐ Replace after disassembly
- ☐ 25 Nm

21 - Straps

- ☐ pay attention to different lengths

22 - Fuel feed line

- ☐ black
- ☐ from fuel filter to fuel distributor at intake manifold

23 - Fuel filter

- ☐ with integrated pressure limiting valve for fuel return-flow line
Opening pressure: 0.40 MPa (4.0 bar)
- ☐ The direction of flow of fuel is marked by arrow
- ☐ Fitting position: Pin at filter housing must engage in the recess of the guide at the filter holder
- ☐ Summary of components ⇒ ["4.1 Summary of components - fuel filter", page 211](#)

24 - Screw clamp

- ☐ for fuel filter

- ❑ replaced with integrated bracket for fuel filter

25 - Vent line

- ❑ between activated charcoal filter Pos. -14- and vent line Pos. -25-

26 - Vent line

- ❑ to solenoid valve 1 for activated charcoal filter - N80- in engine compartment

Fitting location of the fuel delivery unit



Note

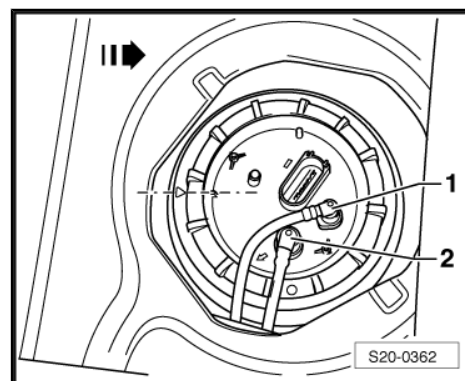
The fuel delivery unit can only be installed in this position.

The marking on the flange must be aligned with the marking on the fuel tank.

The -arrow- shows the direction of travel.

Connect blue or blue marked return-flow line -1- to the connection with the marking -R-.

Connect black feed line -2- to connection with marking -V-.



Inspect vent valve

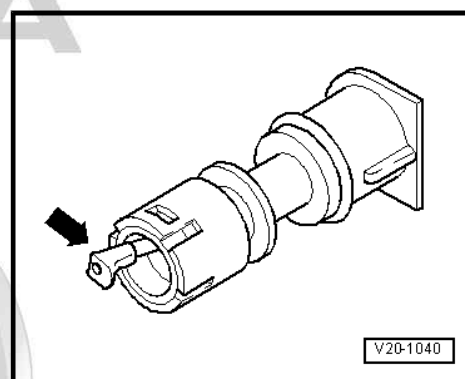
Lever in zero position: Valve closed.

Lever pressed in direction of the arrow: Valve open.



Note

Before installation of the bleeder valve unscrew the cap from the filler neck.



1.2 Drain the fuel tank

Special tools and workshop equipment required

- ◆ Hose adapter , e.g. -V.A.G 1318/16-
- ◆ Adapter , e.g. -V.A.G 1318/17-
- ◆ Measuring tool set , e.g. -V.A.G 1594C-
- ◆ Battery
- ◆ Catch pan for fuel

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Note

If the fuel pump is defective, suction off fuel using a fuel suction device, e.g. -VAS 5190- .



Work procedure



Note

- ♦ *Safety precautions when working on the fuel supply system*
⇒ *"2.1 Safety precautions when working on fuel supply system", page 3*.
- ♦ *Rules of cleanliness when working on the fuel supply system*
⇒ *"3.1 Rules of cleanliness", page 8*.
- Switch off ignition and all electrical loads, and pull out ignition key.

For vehicles Octavia II, Superb II and Rapid NH

- Removing rear seat bench ⇒ Body Work; Rep. gr. 72.

For vehicles Yeti

- Remove rear seat bench with brackets ⇒ Body Work; Rep. gr. 72.
- Remove floor covering under the rear seats.

Continued for all vehicles

- Unclip the cover -4- with the fuel pump control unit - J538- -1-.

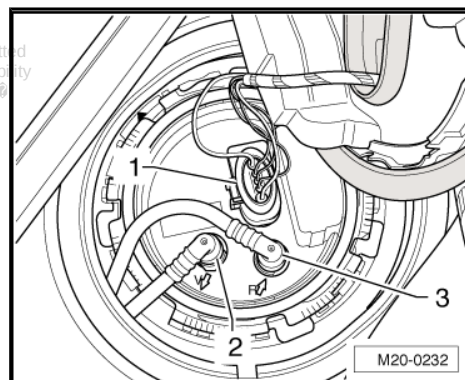
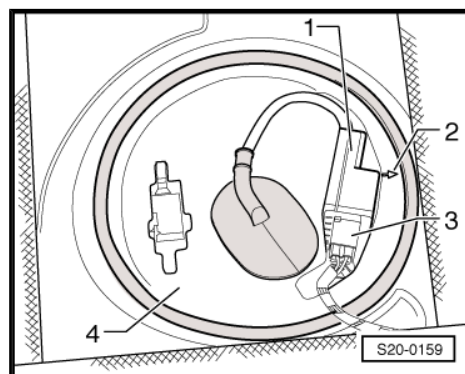
Vehicles with auxiliary heating.

- Unplug the 2-pin plug of the dosing pump - V54- .

Continued for all vehicles

- Unplug the 5-pin plug -1- and the black feed line -2-. Disconnect quick couplings

⇒ *"3.1 Separating quick couplings", page 207*

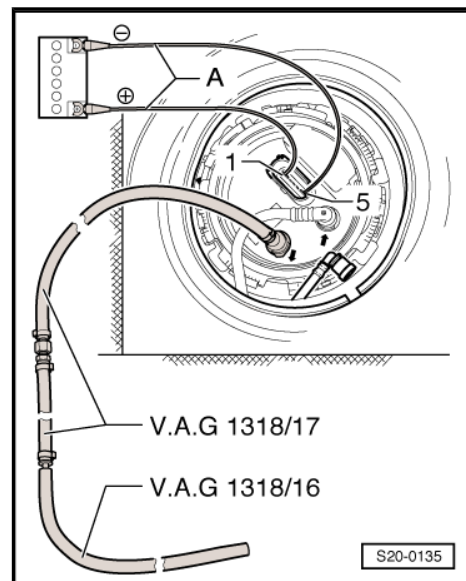


- Connect the adapter -V.A.G 1318/16- and -V.A.G 1318/17- and fit this “drain pipe” onto the feed support of the fuel delivery unit.
 - Hold the “drain pipe” in a suitable fuel tank.
 - Connect the battery and the contacts of the fuel pump with adapter cables -A- from the adapter cable set - V.A.G 1594/ C- as follows:
Battery positive terminal (+) to contact -1- of the fuel pump
Battery negative terminal (-) to contact -5- of the fuel pump
- The fuel pump runs and suctions off fuel.



WARNING

In order to prevent an overflow of fuel in case of a too small fuel tank, the fuel pump must not run unattended.



1.3 Removing and installing the fuel tank

⇒ [“1.3.1 Removing and installing fuel tank \(Octavia II, Yeti\)”](#), page 187

⇒ [“1.3.2 Removing and installing fuel tank \(Superb II\)”](#), page 189

⇒ [“1.3.3 Removing and installing the fuel tank \(Rapid NH\)”](#), page 192

1.3.1 Removing and installing fuel tank (Octavia II, Yeti)

Special tools and workshop equipment required

- ◆ Engine and gearbox jack . e.g. -V.A.G 1383A-
- The fuel tank must be empty for weight reasons when removing it, if necessary suction the fuel out of the fuel tank
⇒ [“1.2 Drain the fuel tank”](#), page 185 .

Removing



Note

- ◆ *Safety precautions when working on the fuel supply system*
⇒ [“2.1 Safety precautions when working on fuel supply system”](#), page 3
- ◆ *Rules of cleanliness when working on the fuel supply system*
⇒ [“3.1 Rules of cleanliness”](#), page 8 .

- Switch off ignition and all electrical loads, and pull out ignition key.

For vehicles Octavia II

- Removing rear seat bench ⇒ Body Work; Rep. gr. 72 .

For vehicles Yeti

- Remove rear seat bench with brackets ⇒ Body Work; Rep. gr. 72 .
- Remove floor covering under the rear seats.

Continued for all vehicles

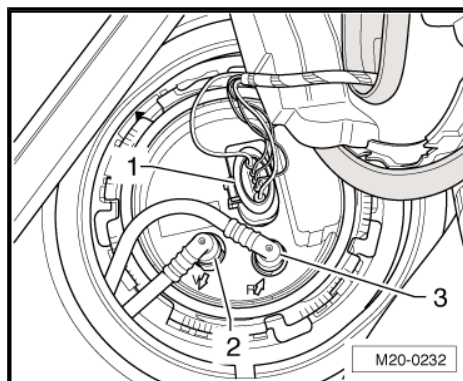
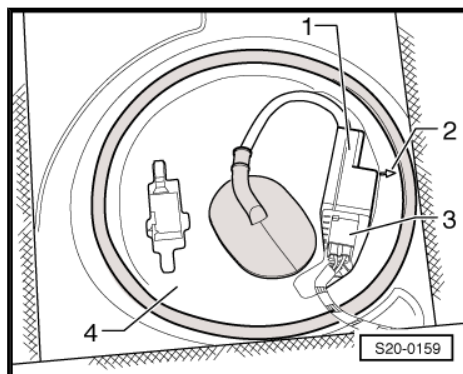
- Unclip the cover -4- with the fuel pump control unit - J538- -1-.

Vehicles with auxiliary heating.

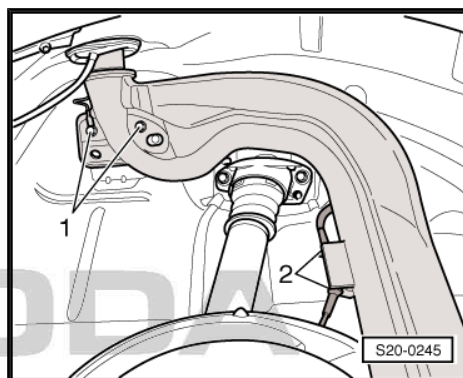
- Unplug the 2-pin plug of the dosing pump - V54- .
- Remove the rubber grommet from the cover of the fuel delivery unit and pull out the wiring.

Continued for all vehicles

- Unplug the 5-pin plug -1- from the fuel pump.
- Open the fuel tank cap and clean around the fuel filler neck.
- Unscrew the cap from the fuel filler neck.
- Seal the filler neck with a clean foam piece in order to avoid any foreign bodies from entering.
- Unscrew right rear wheel.
- Remove the rear right wheelhouse liner ⇒ Body Work; Rep. gr. 66 .



- Unscrew screws -1- for filler neck on the body.
- Unclip the electrical cable from the bracket -2- at the top and bottom of the filler neck.



- Disconnect vent line -1- (white) and fuel feed line -2- (black) at the connection point. Disconnect quick couplings ⇒ [“3.1 Separating quick couplings”, page 207](#) .

Vehicles with auxiliary heating.

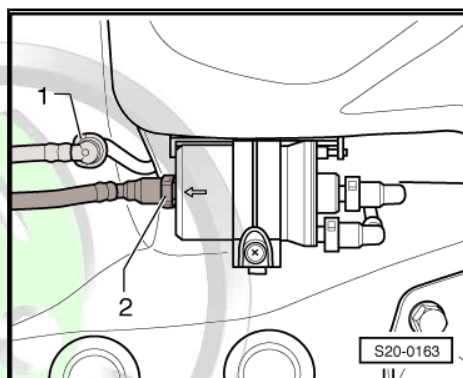
- Disconnect the fuel line from the dosing pump - V54- .

Continued for all vehicles

- Remove the middle silencer ⇒ [“2.1 Summary of components - exhaust gas cleaning”, page 309](#)

If necessary the middle and rear silencers must be disconnected

⇒ [“1.2 Separating exhaust pipes, silencers”, page 306](#) .

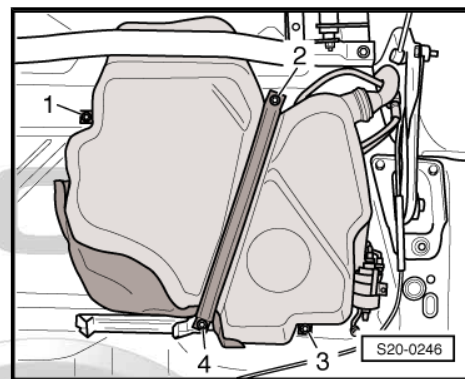


- Release fixing screws -2- and -4- and remove the tensioning strap.
- Support the fuel tank using the engine and gearbox jack - V.A.G 1383A- .
- Release fixing screws -1- and -3-.
- Slightly lower the fuel tank.



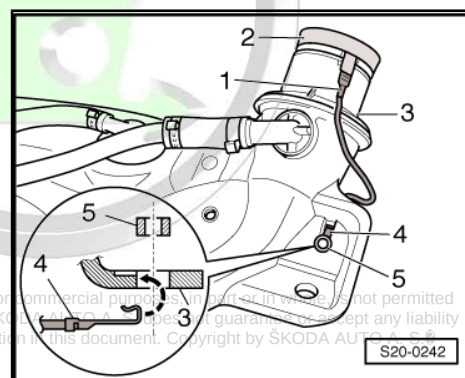
Note

The filler neck must be "extracted" between body and rear axle. Lift fuel tank down from the engine and gearbox jack - V.A.G 1383A- with a second mechanic.



Install

- Check both earth connections for corrosion, if necessary remove corrosion.
- Check the fitting position of the earth lead -1-.
- The plug -1- must be firmly attached to the sheet metal ring -2-.
- The contact tab -4- must be hung on the fuel tank -3- and secured with the spacer bush -5-.
- Pull through the filler neck between the body and the rear axle with the help of a second mechanic. Then position the fuel tank onto the engine/gearbox jack - V.A.G 1383A- .



Further installation occurs in reverse order. Pay attention to the following:

- ◆ Lay the vent and fuel lines without any kinks.
- ◆ Do not mix-up the feed line and the return-flow line (the return-flow line is blue, the feed line is black).
- ◆ Make sure the line connections fit tightly.
- ◆ Check earth connection of fuel tank/body at filler neck.
- ◆ After installing the fuel tank, check whether the lines are also clipped in place on the fuel tank.

Tightening torques

- ◆ ⇒ ["1.1.1 Summary of components - fuel tank \(Octavia II and Yeti\)", page 179](#)
- ◆ Middle silencer Octavia II
⇒ ["1.1.1 Summary of components - silencer \(Octavia II\)", page 302](#)
- ◆ Middle silencer Yeti
⇒ ["1.1.3 Summary of components - silencer \(Yeti\)", page 304](#)

1.3.2 Removing and installing fuel tank (Superb II)

Special tools and workshop equipment required

- ◆ Engine and gearbox jack . e.g. -V.A.G 1383A-
- The fuel tank must be empty for weight reasons when removing it, if necessary suction the fuel out of the fuel tank
⇒ ["1.2 Drain the fuel tank", page 185](#) .

Removing



Note

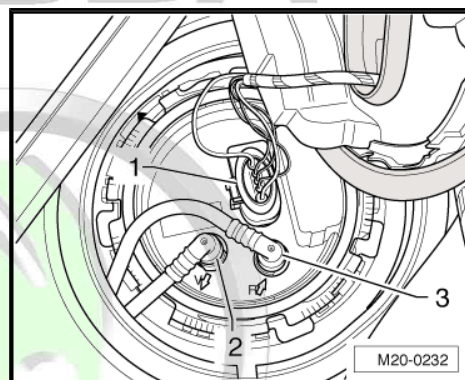
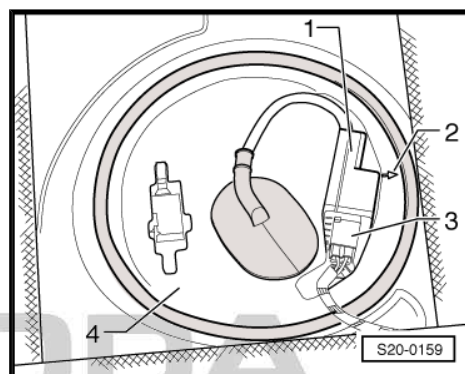
- ◆ *Safety precautions when working on the fuel supply system*
⇒ *"2.1 Safety precautions when working on fuel supply system", page 3*.
- ◆ *Rules of cleanliness when working on the fuel supply system*
⇒ *"3.1 Rules of cleanliness", page 8*.
- Switch off all electrical components and take out the ignition key.
- Removing rear seat bench ⇒ Body Work; Rep. gr. 72.
- Unclip the cover -4- with the fuel pump control unit - J538- -1-.

Vehicles with auxiliary heating.

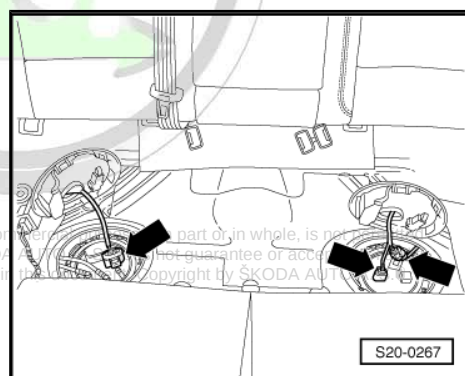
- Unplug the 2-pin plug of the dosing pump - V54- .
- Remove the rubber grommet from the cover of the fuel delivery unit and pull out the wiring.

Continued for all vehicles

- Unplug the 5-pin plug -1- from the fuel tank.



- Remove covers from fuel gauge sender 2 - G169- (as shown in the right figure) and disconnect plug -right arrows-.
- Open the fuel tank cap and clean around the fuel filler neck.
- Unscrew the cap from the fuel filler neck.
- Seal the filler neck with a clean foam piece in order to avoid any foreign bodies from entering.
- Remove the rear right wheelhouse liner ⇒ Body Work; Rep. gr. 66.



- Unscrew screws -1- for filler neck on the body.
- Unclip the electrical cable from the bracket -2- at the top and bottom of the filler neck.

ŠKODA

- Disconnect vent line -1- (white) and fuel feed line -2- (black) at the connection point. Disconnect quick couplings
⇒ [“3.1 Separating quick couplings”, page 207](#) .

Vehicles with auxiliary heating.

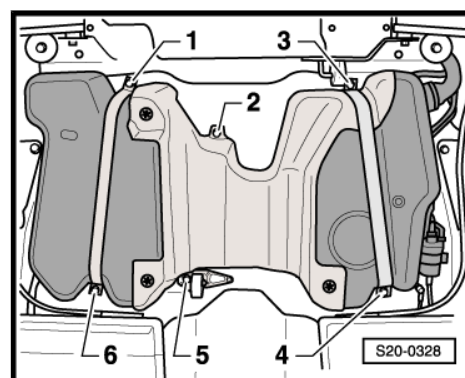
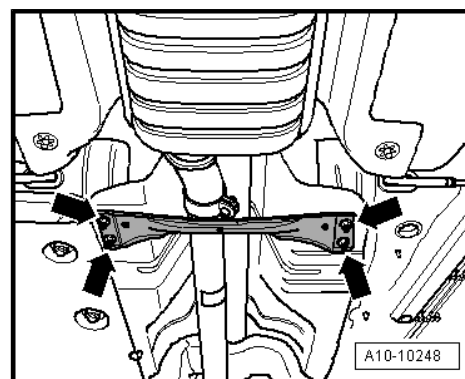
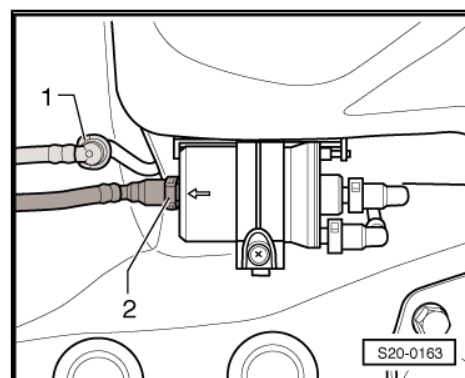
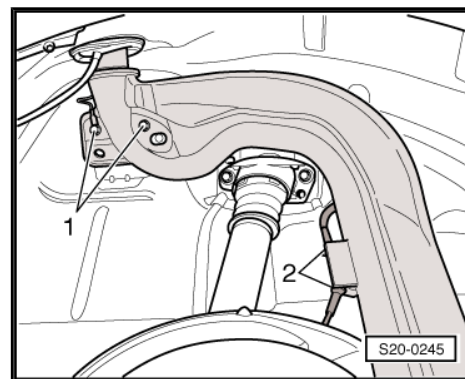
- Disconnect the fuel line from the dosing pump - V54- .

Continued for all vehicles

- Remove rear tunnel bridge -arrows-.
- Remove middle and rear silencer
⇒ [“1.1.2 Summary of components- silencer \(Superb II\)”, page 303](#)

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- First of all screw out the screws -2- and -5-.



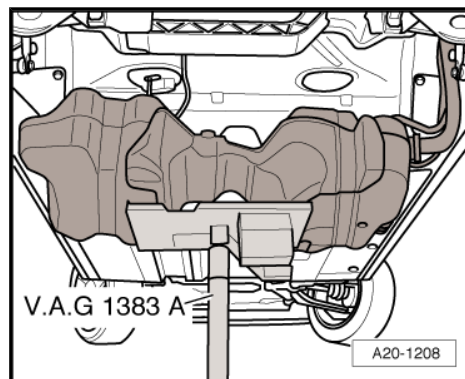


- Support the fuel tank using the engine and gearbox jack - V.A.G 1383A- .
- Unscrew the screws for the tensioning straps -1-, -3-, -4- and -6-.
- Slightly lower the fuel tank using the engine and gearbox jack - V.A.G 1383A- .



Note

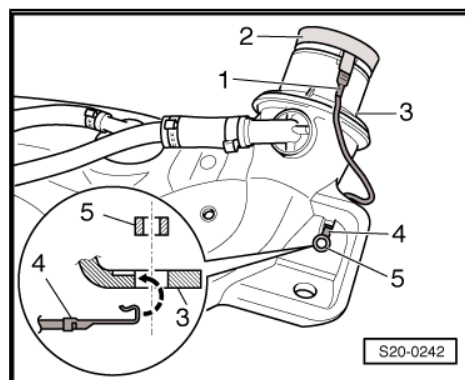
The filler neck must be "extracted" between body and rear axle. Lift fuel tank down from the engine and gearbox jack - V.A.G 1383A- with a second mechanic.



Install

- Check both earth connections for corrosion, if necessary remove corrosion.
- Check the fitting position of the earth lead -1-.
- The plug -1- must be firmly attached to the sheet metal ring -2-.
- The contact tab -4- must be hung on the fuel tank -3- and secured with the spacer bush -5-.
- Pull through the filler neck between the body and the rear axle with the help of a second mechanic. Then position the fuel tank onto the engine/gearbox jack - V.A.G 1383A- .

Further installation occurs in reverse order. Pay attention to the following:



- ♦ Lay the vent and fuel lines without any kinks.
- ♦ Do not mix-up the feed line and the return-flow line (the return-flow line is blue, the feed line is black).
- ♦ Make sure the line connections fit tightly.
- ♦ Check the earth connection of the fuel tank at the body on the filler neck.
- ♦ After installing the fuel tank, check whether the lines are also clipped in place on the fuel tank.

Tightening torques

- ♦ ⇒ ["1.1.2 Summary of components - fuel tank \(Superb II\)", page 181](#)
- ♦ Middle silencer
⇒ ["1.1.2 Summary of components- silencer \(Superb II\)", page 303](#)
- ♦ Tunnel bridge ⇒ Body work; Rep. gr. 66 .

1.3.3 Removing and installing the fuel tank (Rapid NH)

Special tools and workshop equipment required

- ♦ Engine and gearbox jack , e.g. -V.A.G 1383A-

Removing

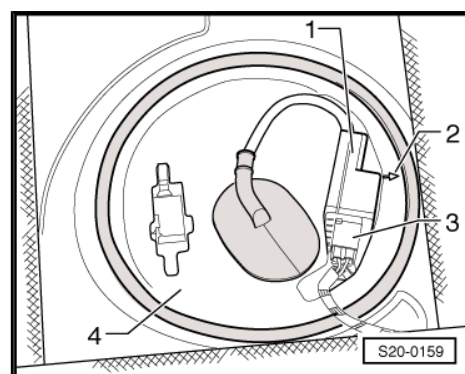
- The fuel tank must be empty for weight reasons when removing it, if necessary suction the fuel out of the fuel tank
⇒ ["1.2 Drain the fuel tank", page 185](#) .

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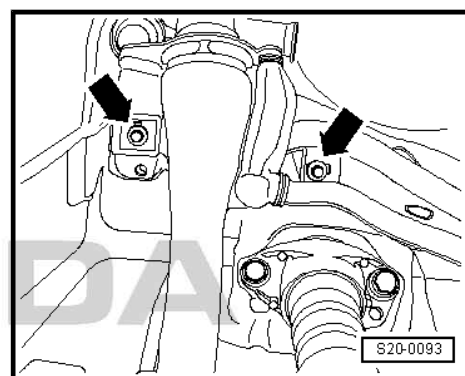
i Note

- ♦ *Safety precautions when working on the fuel supply system*
⇒ *"2.1 Safety precautions when working on fuel supply system", page 3*.
- ♦ *Rules of cleanliness when working on the fuel supply system*
⇒ *"3.1 Rules of cleanliness", page 8*.

- Switch off ignition and all electrical loads, and pull out ignition key.
- Removing rear seat bench ⇒ Body Work; Rep. gr. 72.
- Unclip the cover -4- with the fuel pump control unit - J538-1-.
- Disconnect the plug from the fuel delivery unit.
- Clean area around fuel filler neck.
- Unscrew right rear wheel.
- Remove the rear right wheelhouse liner ⇒ Body Work; Rep. gr. 66.
- Open fuel tank flap and unscrew cap from filler neck.



- Unscrew fixing screws on tank filler neck -arrows-.
- Remove both ventilation lines from activated charcoal filter
⇒ *"5.1.2 Summary of components - activated charcoal filter system (Rapid NH)", page 215*, Pos. 6 and 7.
- Removing rear axle ⇒ Chassis; Rep. gr. 42.



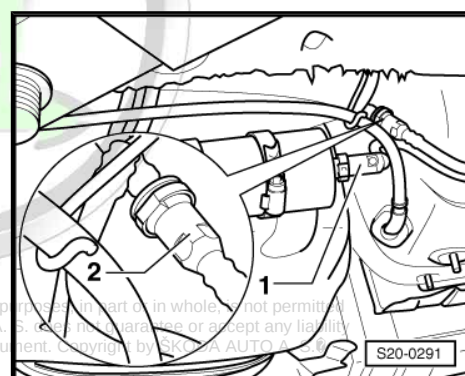
WARNING

The fuel feed line is pressurized! Place a clean cleaning cloth around the connection point before detaching hose connections. Reduce pressure by carefully releasing the connection point.

i Note

Always press in the securing ring in order to unlock the caps of the fuel lines.

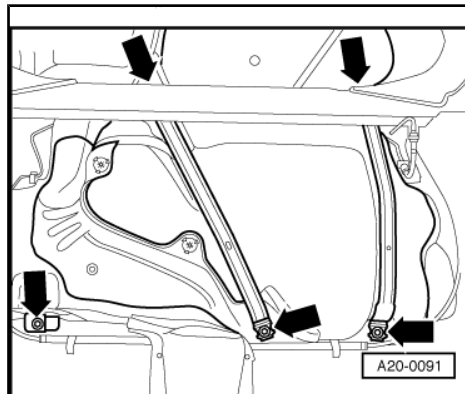
- Disconnect the feed line -1- and the vent line -2-.
- Support the fuel tank using the engine and gearbox jack - V.A.G 1383A-.
- Remove underbody cover on left ⇒ Body work; Rep. gr. 50.



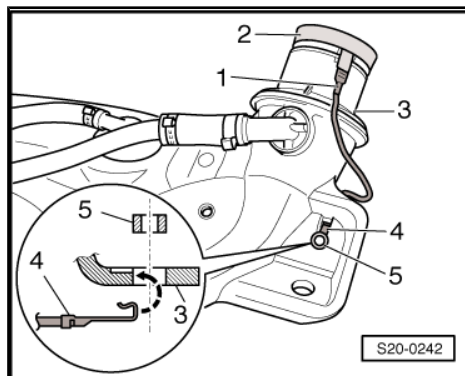
- Unscrew tensioning straps and fixing screw of the fuel tank -arrows-.
- Carefully lower the engine/gearbox jack -V.A.G 1383A- and remove the fuel tank with the assistance of a second mechanic.

Install

- Check both earth connections for corrosion, if necessary remove corrosion.



- Check the fitting position of the earth lead -1-.
- The plug -1- on the metal plate ring -2- must be pushed on firmly.
- The contact tab -4- must be hung on the fuel tank -3- and secured with the spacer bush -5-.

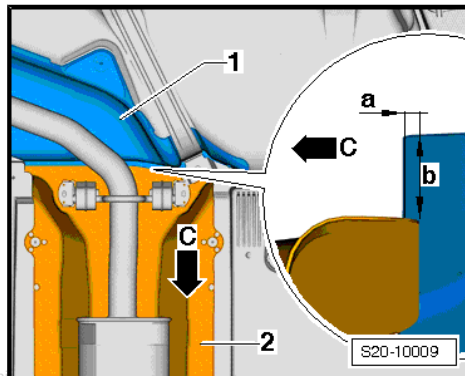


Installation is carried out in the reverse order. When installing, note the following:



Note

- ♦ Make sure that the heat shield for fuel tank -1- does not collide with the tunnel-heat shield -2- when installing the fuel tank.
- ♦ Tunnel-heat shield -2- must moderately cover the fuel tank heat shield in direction of travel -C-n.
- ♦ Lay the vent and fuel lines without any kinks.
- ♦ Do not mix-up the feed line and the return-flow line (the return-flow line is blue, the feed line is black).
- ♦ Make sure the line connections fit tightly.
- ♦ After installing the fuel tank, check whether the lines are also clipped in place on the fuel tank.



Tightening torques

- ♦ ⇒ ["1.1.3 Summary of components - fuel tank \(Rapid NH\)", page 183](#)
- ♦ Rear axle ⇒ Chassis; Rep. gr. 42
- ♦ Underfloor trim panel ⇒ Body Work; Rep. gr. 50 .

2 Fuel delivery unit, fuel gauge sender

⇒ [“2.1 Removing and installing fuel delivery unit, fuel gauge sender”, page 195](#)

⇒ [“2.2 Removing and installing the sender for fuel gauge display G”, page 202](#)

⇒ [“2.3 Removing and installing fuel gauge sender 2 G169”, page 204](#)

2.1 Removing and installing fuel delivery unit, fuel gauge sender

⇒ [“2.1.1 Removing and installing fuel delivery unit/fuel gauge sender \(Octavia II, Yeti\)”, page 195](#)

⇒ [“2.1.2 Removing and installing fuel delivery unit/fuel gauge sender \(Superb II\)”, page 197](#)

⇒ [“2.1.3 Removing and installing the fuel delivery unit/fuel gauge sender \(Rapid NH\)”, page 200](#)

2.1.1 Removing and installing fuel delivery unit/fuel gauge sender (Octavia II, Yeti)

Special tools and workshop equipment required

- ◆ Key - T30101 (3087)-

Removing

- The fuel tank must not be more than $\frac{3}{4}$ full.



Note

- ◆ *If necessary, extract fuel from the fuel tank*
⇒ [“1.2 Drain the fuel tank”, page 185](#).

- ◆ *Safety precautions when working on the fuel supply system*
⇒ [“2.1 Safety precautions when working on fuel supply system”, page 3](#).

- ◆ *Rules of cleanliness when working on the fuel supply system*
⇒ [“3.1 Rules of cleanliness”, page 8](#).

- Switch off ignition and all electrical loads, and pull out ignition key.

For vehicles Octavia II

- Removing rear seat bench ⇒ Body Work; Rep. gr. 72.

For vehicles Yeti

- Remove rear seat bench with brackets ⇒ Body Work; Rep. gr. 72.
- Remove floor covering under the rear seats.

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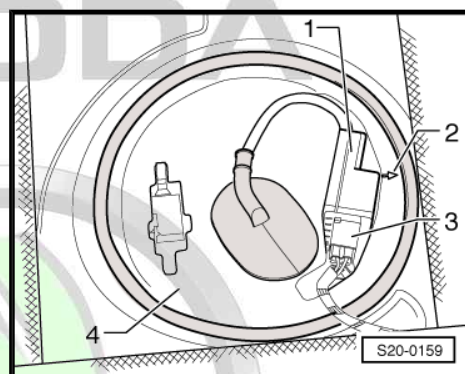
Continued for all vehicles

- Unclip the cover -4- with the fuel pump control unit - J538-
-1-.



Note

For vehicles with auxiliary heating, the plug connection for the dosing pump - V54- must also be disconnected.

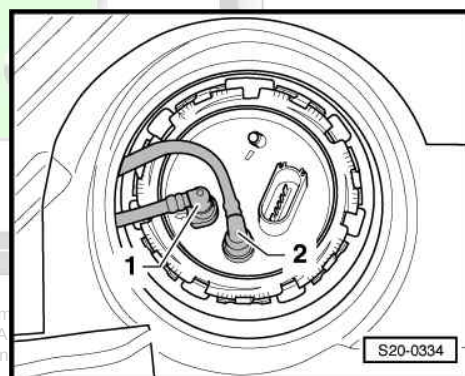


- Unplug the 5-pin plug, the black feed line -1- and the blue re-
turn-flow line -2-.



Note

- ◆ *Press in the securing ring in order to unlock the lines.*
- ◆ *For vehicles with auxiliary heating the suction line for the dosing pump - V54- must be pulled out additionally (open lower clamp).*



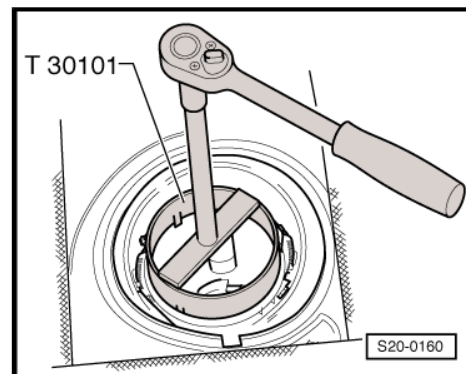
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- Open lock ring with the wrench - T30101- .



Note

- ◆ Remove fuel delivery unit from the fuel tank so that the electric lines and fuel hoses are not damaged and the float arm of the sender for fuel gauge display - G- is not bent.
- ◆ You must empty the old delivery unit before disposing of it if you wish to replace the fuel delivery unit.
- Pull the fuel delivery unit out of the opening of the fuel tank.



Install

Installation is carried out in the reverse order. When installing, note the following:

- Insert the new dry gasket ring into the opening of the fuel tank and moisten only from the inside with fuel for installing the closing flange.
- Insert the fuel delivery unit into the fuel tank in such a way that the float arm of the sender for the fuel gauge display - G- is not bent.
- Press the closing flange downwards, install the lock ring and connect the fuel lines.



Note

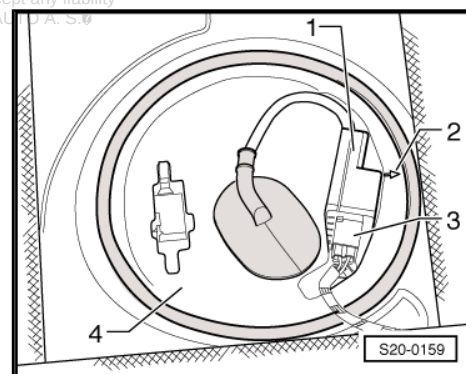
- ◆ Pay attention to installation position of flange of fuel delivery unit
⇒ [Fig. "Fitting location of the fuel delivery unit", page 181](#) .
- ◆ Do not interchange the black feed line with the blue return-flow line (arrows on the flange of the fuel delivery unit).
- ◆ Make sure the line connections and the 5-pin plug fit tightly.
- ◆ After installing the fuel delivery unit, check whether the feed line and the return-flow line have also been clipped in place on the fuel tank.

- Clip on cover -4- with fuel pump control unit - J538 -1-.

The arrow -2- on the cover points in direction of travel.

Tightening torques

- ◆ ⇒ ["1.1.1 Summary of components - fuel tank \(Octavia II and Yeti\)", page 179](#)



2.1.2 Removing and installing fuel delivery unit/fuel gauge sender (Superb II)

Removing

- The fuel tank must not be more than $\frac{1}{3}$ full.



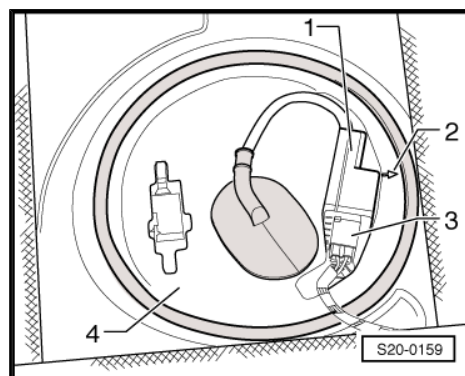
Note

- ◆ *If necessary drain the fuel tank*
⇒ *"1.2 Drain the fuel tank", page 185* .
- ◆ *Safety precautions when working on the fuel supply system*
⇒ *"2.1 Safety precautions when working on fuel supply system", page 3* .
- ◆ *Rules of cleanliness when working on the fuel supply system*
⇒ *"3.1 Rules of cleanliness", page 8* .
- Switch off ignition and all electrical loads, and pull out ignition key.
- Removing rear seat bench ⇒ Body Work; Rep. gr. 72 .
- Unclip the cover -4- with the fuel pump control unit - J538- -1-.

Vehicles with auxiliary heating.

- Unplug the 2-pin plug of the dosing pump - V54- .

Continued for all vehicles



- Disconnect the plug as well as the black feed line -1- and the blue return-flow line -2- from the flange.



Note

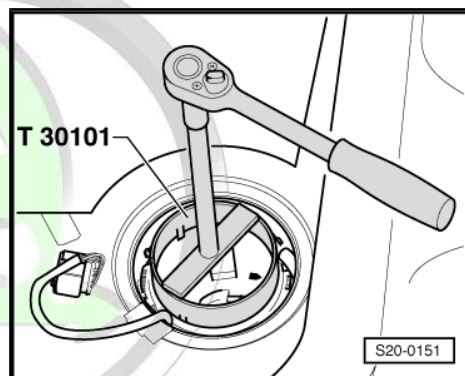
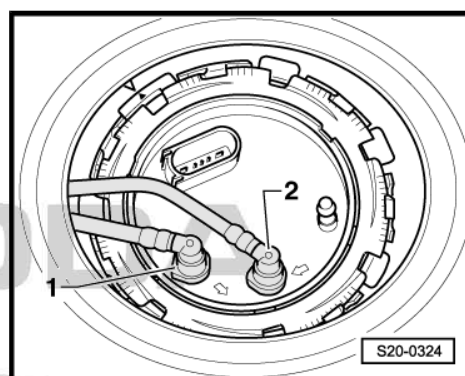
Press in the securing ring in order to unlock the lines.

Vehicles with auxiliary heating.

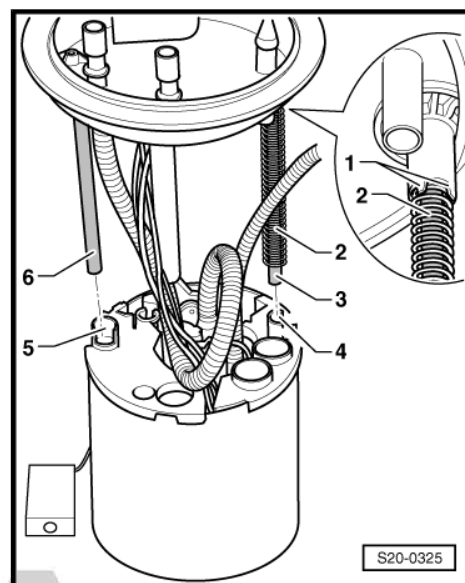
- Pull out the suction line for the dosing pump - V54- (slacken lower clamp).

Continued for all vehicles

- Open lock ring with the wrench - T30101- .



- Slightly raise the closing flange and check if the spring -2- is still fastened on the flange -1-.
- If the spring -2- is loose on the guide pipe -3-, hold it with your fingers while removing the closing flange.
- Pull closing flange and gasket ring for fuel pump out of the opening of the fuel tank and place to the side with the connected lines.



- Separate through the opening of the fuel tank the fuel line -1- to the suction jet pump, to do so press the release button.
- Disconnect the fuel delivery line -2- from the fuel delivery unit.



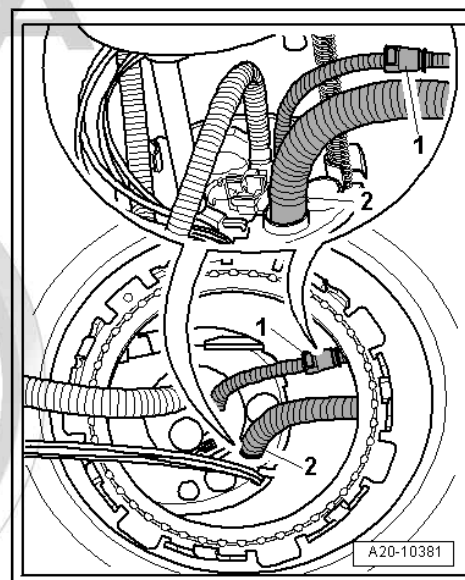
Note

- ◆ You must wear protective gloves for removing the fuel delivery unit.
- ◆ Remove fuel delivery unit from the fuel tank so that the electric lines and fuel hoses are not damaged and the float arm of the sender for fuel gauge display - G- is not bent.
- ◆ You must empty the old delivery unit before disposing of it if you wish to replace the fuel delivery unit.
- Pull the fuel delivery unit out of the opening of the fuel tank.

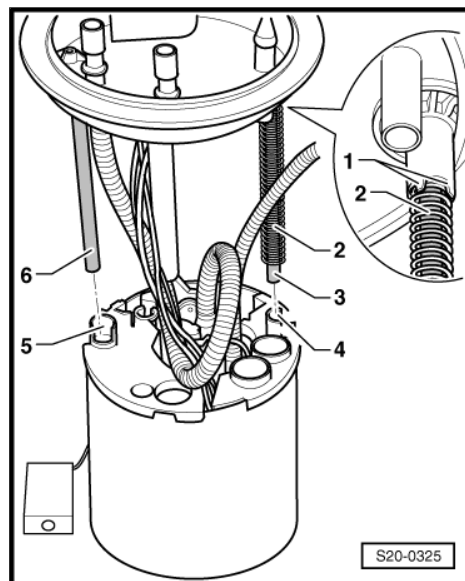
Install

Installation is carried out in the reverse order. When installing, note the following:

- Insert the new dry gasket ring into the opening of the fuel tank and moisten only from the inside with fuel for installing the closing flange.
- Insert the fuel delivery unit into the fuel tank with the closing flange placed to the side. Thus, do not bend the float arm of the fuel gauge sender unit - G- .
- Connect vacuum pump and its fuel line
⇒ [“2.3 Removing and installing fuel gauge sender 2 G169 ”, page 204](#) .



- The spring -2- must be fastened to the retaining lugs -1- of the closing flange.
- First of all guide the guide pipe -3- into the guide bore -4-.
- Then lower the closing flange in such a way that the guide pipe -6- locks into the guide bore -5-.



Note

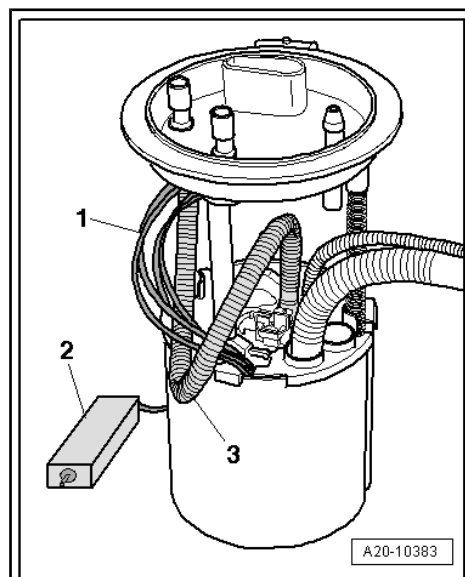
Pay attention that the electric cables -1- and the fuel feed line -3- are routed according to the illustration and the float arm -2- does not become blocked.

- Press the closing flange down and bring it into the installation position.

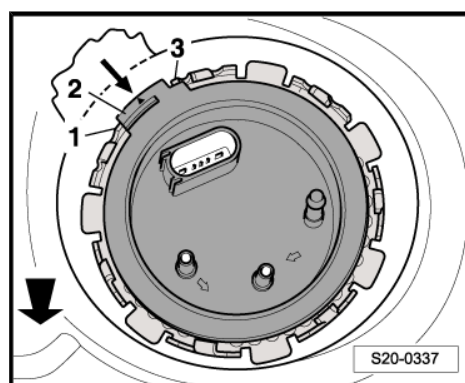


Note

Observe the fitting location of the fuel delivery unit
⇒ Fig. "Installation position of the fuel delivery unit and the fuel gauge sender 2 -G169- ", page 183.



- ◆ The peg -2- at the closing flange must be located between the pegs -1- and -3- at the fuel tank. The -arrow- shows the direction of travel.
- ◆ Do not interchange feed line and return-flow line.
- ◆ Make sure the fuel lines fit tightly.
- ◆ After installing the fuel delivery unit, check whether the feed and return-flow lines are still clipped in place on the fuel tank.
- ◆ If the fuel delivery unit has been replaced the engine control unit must be adapted to the fuel pump ⇒ Vehicle diagnostic tester "Targeted function".



Tightening torques

- ◆ ⇒ "1.1.2 Summary of components - fuel tank (Superb II)", page 181

2.1.3 Removing and installing the fuel delivery unit/fuel gauge sender (Rapid NH)

Special tools and workshop equipment required

- ◆ Wrench for union nut - MP 1-227 (3217)-

Removing

- The fuel tank must not be more than $\frac{3}{4}$ full.



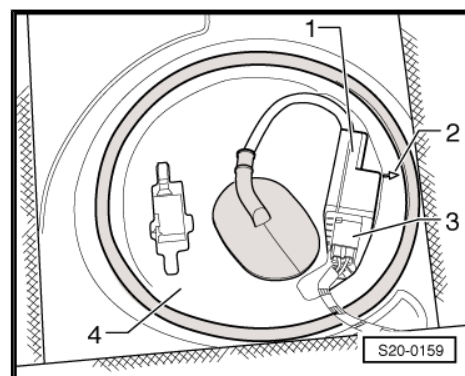
Note

- ◆ If necessary, extract fuel from the fuel tank
⇒ "1.2 Drain the fuel tank", page 185.
- ◆ Observe the safety instructions before starting fitting work
⇒ "2.1 Safety precautions when working on fuel supply system", page 3.
- ◆ Observe rules for cleanliness
⇒ "3.1 Rules of cleanliness", page 8.
- Switch off ignition and all electrical loads, and pull out ignition key.
- Removing rear seat bench ⇒ Body Work; Rep. gr. 72.
- Unclip the cover -4- with the fuel pump control unit - J538-1-.
- Disconnect the 5-pin plug, the feed line and the return-flow line from the flange of the fuel delivery unit.



Note

Press in the securing ring in order to unlock the line.



WARNING

The fuel feed line is pressurized! Place a clean cleaning cloth around the connection point before detaching hose connections. Reduce pressure by carefully releasing the connection point.



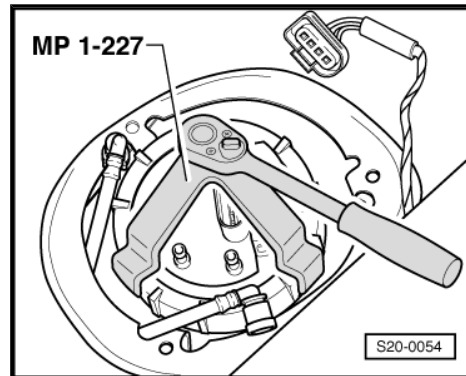


- Unscrew union nut with wrench for union nut - MP 1-227 (3217)- .



Note

- ◆ Remove fuel delivery unit from the fuel tank so that the electric lines and fuel hoses are not damaged and the float arm of the sender for fuel gauge display - G- is not bent.
- ◆ You must empty the old delivery unit before disposing of it if you wish to replace the fuel delivery unit.
- Pull the fuel delivery unit out of the opening of the fuel tank.



Install

Installation of the fuel delivery unit occurs in reverse order to removal. Pay attention to the following:



Note

- ◆ When installing the fuel delivery unit, ensure that the arm of the sender for fuel gauge display is not bent.
- ◆ Insert dry gasket ring of the fuel delivery unit into the opening of the fuel tank.
- ◆ Only moisten gasket ring with fuel before assembly of the fuel delivery unit.
- ◆ Pay attention to installation position of flange of fuel delivery unit
⇒ [Fig. "Fitting location of the fuel delivery unit", page 185](#) .
- ◆ Do not interchange feed line and return-flow line.
- ◆ Make sure the fuel hoses fit tightly.
- ◆ After installing the fuel delivery unit, check whether the feed, return-flow and vent lines are clipped in place on the fuel tank.

Tightening torques

- ◆ ⇒ ["1.1.3 Summary of components - fuel tank \(Rapid NH\)", page 183](#)

2.2 Removing and installing the sender for fuel gauge display - G-



Note

There are two types of senders for the fuel gauge display - G- installed in the vehicles.

Fuel gauge sender - G- type one

Removing

- Remove fuel delivery unit:
- ◆ Octavia II
⇒ ["2.1.1 Removing and installing fuel delivery unit/fuel gauge sender \(Octavia II, Yeti\)", page 195](#) .

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- Unlatch and disconnect the plug connection of the lines -1- (brown), -2- (blue) and -3- (black).
- Raise securing tabs -4- and -5- with a screwdriver and remove the sender for fuel gauge display - G- downwards -arrow-.

Install

- Insert the sender for the fuel gauge display - G- in the guides at the fuel delivery unit and press upwards until it latches into position.
- Connect lines and check that the plug catch is securely locked.
- Install fuel delivery unit:

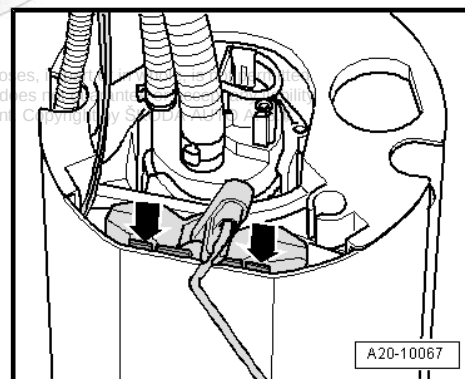
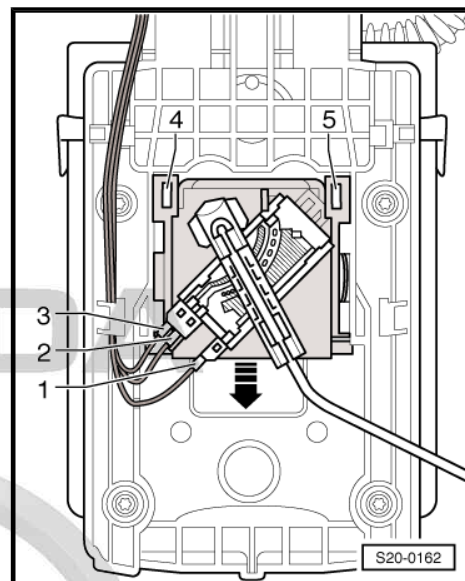
- ◆ Octavia II
⇒ ["2.1.1 Removing and installing fuel delivery unit/fuel gauge sender \(Octavia II, Yeti\)", page 195](#) .

Fuel gauge sender - G- type two

Removing

- Remove fuel delivery unit:
- ◆ Octavia II, Yeti
⇒ ["2.1.1 Removing and installing fuel delivery unit/fuel gauge sender \(Octavia II, Yeti\)", page 195](#) .
- ◆ Superb II
⇒ ["2.1.2 Removing and installing fuel delivery unit/fuel gauge sender \(Superb II\)", page 197](#) .
- ◆ Rapid NH
⇒ ["2.1.3 Removing and installing the fuel delivery unit/fuel gauge sender \(Rapid NH\)", page 200](#) .

- Unlock the catches -arrows- using a screwdriver and pull out the sender for the fuel gauge display - G- towards the top.



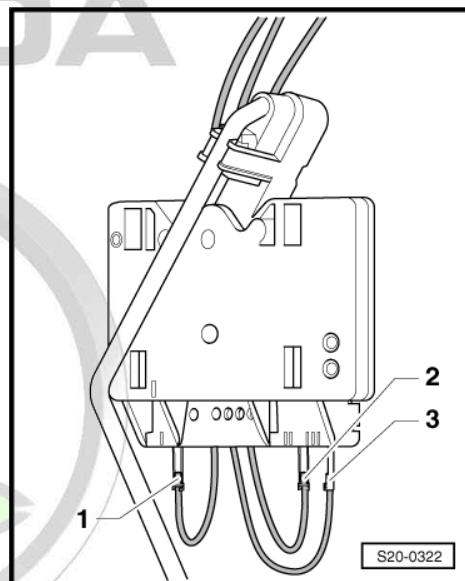


- Unlatch and disconnect the plug connection of the lines -1- (brown), -2- (blue) and -3- (black).

Install

- Connect the wiring and check correct installation of the plug.
- Insert the sender for fuel gauge display - G- in the guides at the fuel delivery unit and press downwards until it latches into position.
- Install fuel delivery unit:

- ◆ Octavia II, Yeti
⇒ ["2.1.1 Removing and installing fuel delivery unit/fuel gauge sender \(Octavia II, Yeti\)", page 195](#) .
- ◆ Superb II
⇒ ["2.1.2 Removing and installing fuel delivery unit/fuel gauge sender \(Superb II\)", page 197](#) .
- ◆ Rapid NH
⇒ ["2.1.3 Removing and installing the fuel delivery unit/fuel gauge sender \(Rapid NH\)", page 200](#) .



2.3 Removing and installing fuel gauge sender 2 - G169-

Special tools and workshop equipment required

- ◆ Key - T30101 (3087)-

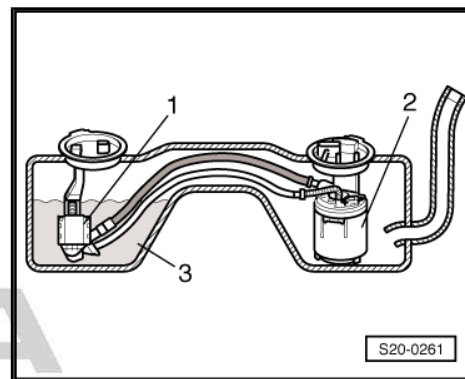
Precondition

- The fuel tank must not be more than $\frac{1}{2}$ full.



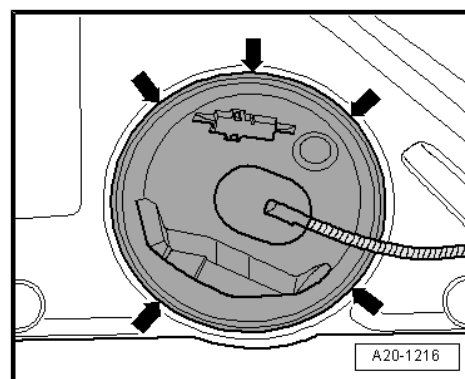
Note

- ◆ The fuel tank consists of a left and right chamber. In order to pump the fuel out of the left chamber -3- of the fuel tank into the right chamber of the fuel delivery unit -2-, a suction jet pump -1- is required.
- ◆ Because of the design of the fuel tank, the fuel must be pumped from the fuel gauge sender 2 - G169- area to the fuel delivery unit using a suction jet pump.
- ◆ A check of the suction jet pump is to be carried out, if the engine stops because of fuel shortage, although the fuel gauge still indicates a fuel tank which is at least $\frac{1}{4}$ full.
- ◆ If necessary, extract fuel from the fuel tank
⇒ ["1.2 Drain the fuel tank", page 185](#) .
- ◆ Safety precautions when working on the fuel supply system
⇒ ["2.1 Safety precautions when working on fuel supply system", page 3](#) .
- ◆ Rules of cleanliness when working on the fuel supply system
⇒ ["3.1 Rules of cleanliness", page 8](#) .
- ◆ Check, if the fuel lines on the suction jet pump are placed on firmly and not damaged and that the suction jet pump is not soiled.
- ◆ Make sure that the float arm of the fuel gauge sender 2 - G169- is not bent.

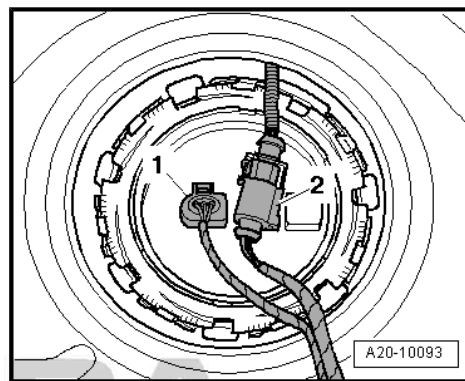


Removing

- Switch off all electrical components and take out the ignition key.
- Removing rear seat bench ⇒ [Body Work; Rep. gr. 72](#) .
- Remove fuel delivery unit
⇒ ["2.1.2 Removing and installing fuel delivery unit/fuel gauge sender \(Superb II\)", page 197](#) .
- Remove cover (on the left in the direction of travel) from fuel gauge sender 2 - G169- -arrows-.



- Disconnect electrical plug connection -1-.
- Take plug connection -2- out of the holder, disconnect and expose electric cable.



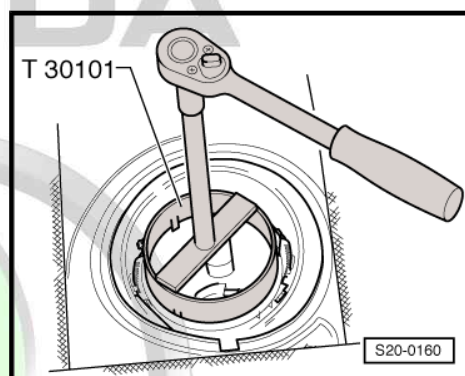
- Open lock ring with the wrench - T30101-.
- Pull fuel gauge sender 2 - G169- together with suction jet pump out of the fuel tank opening.
- Take out sealing ring.

Install



Caution

When installing fuel gauge sender 2 - G169- , do not bend the float arm.



- Insert new dry gasket ring into the opening of the fuel tank and only then moisten the inside (position of the flange) with fuel.
- Insert fuel gauge sender 2 - G169- into the fuel tank.
- Connect fuel lines of the suction jet pump to fuel delivery unit.
- Check fitting position for fuel gauge sender 2 - G169-
⇒ [Fig. "Installation position of the fuel delivery unit and the fuel gauge sender 2 -G169- " , page 183](#) .
- Check correct positioning of gasket ring.
- Tighten lock ring with wrench for union nut - T30101- .
- Mount plug.
- Install cover.
- Install fuel delivery unit
⇒ ["2.1.2 Removing and installing fuel delivery unit/fuel gauge sender \(Superb II\)", page 197](#) .
- Install sill panel ⇒ Body Work; Rep. gr. 72 .

Tightening torques

- ◆ ⇒ ["1.1.2 Summary of components - fuel tank \(Superb II\)", page 181](#)

3 Quick couplings

⇒ "3.1 Separating quick couplings", page 207

3.1 Separating quick couplings

Special tools and workshop equipment required

- ◆ Lever - T10468-

Assign quick couplings



Note

- ◆ The quick couplings of fuel, vacuum and ventilation lines are colour marked. Either the colour point at the quick coupling or the release button has the corresponding colour
⇒ page 207.
- ◆ The push-fit couplings must »audibly« click in place when securing it.
- ◆ Check the quick couplings for firm seating by pulling in the opposite direction!

Colour assignment

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Quick coupling	Colour coding at the quick coupling
Fuel feed line	black
Fuel return-flow line	blue
Vent line	White, beige
Vacuum line	green

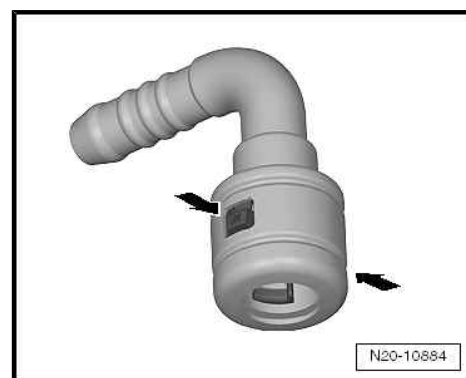


WARNING

The fuel feed line is pressurized! Wear safety goggles and safety clothing, in order to avoid injuries and skin contact with fuel. Place cleaning cloths around the connection point before detaching hose connections. Reduce pressure by carefully removing the hose.

Version 1

Quick coupling with release buttons -arrows- on right and left.

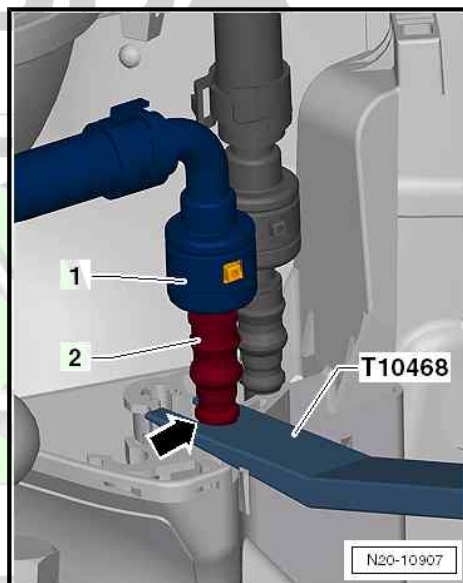




The coupling point -1- in the engine compartment must be held.

- Insert the lever - T10468- between the heat shield and the stop -arrow- of the fuel line -2- and hold it.

Continued for all coupling points:

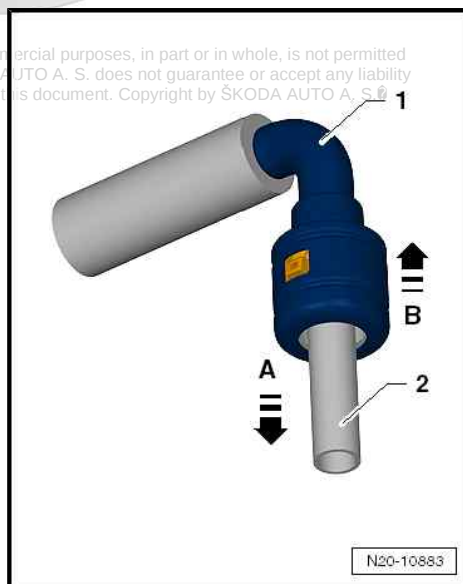


- Press quick coupling -1- in -direction of arrow A-.
- Press the release buttons and remove the quick coupling -1- from the fuel line -2- in direction of the arrow -B-.

Pay attention to the colour assignment when installing
⇒ [page 207](#) .

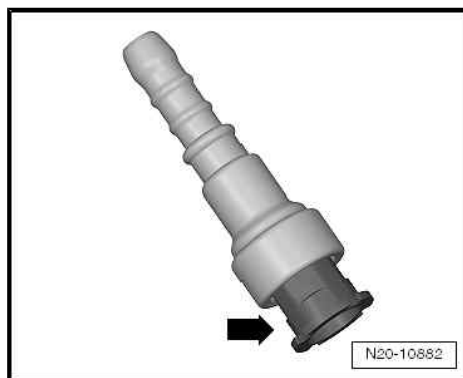
The quick coupling must »audibly« click in place when securing it.

- Check the quick coupling for firm seating by pulling in the opposite direction!



Version 2

Quick coupling with pull-release mechanism -arrow-.

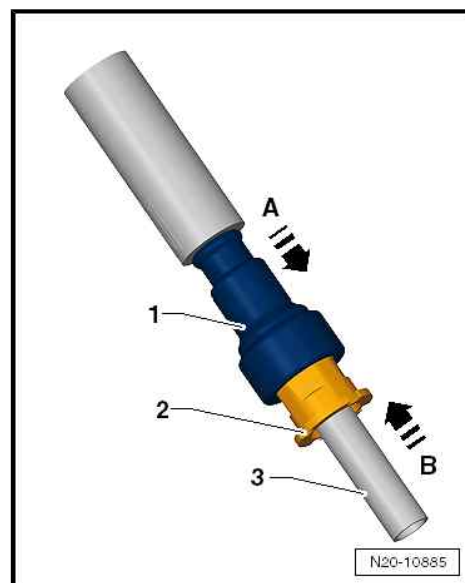


- Press quick coupling -1- in -direction of arrow A-.
- Pull pull-release mechanism -2- in -direction of arrow B-.
- Pull quick coupling -1- off fuel line -3- in -direction of arrow B-.

Pay attention to the colour assignment when installing
⇒ [page 207](#) .

The quick coupling must »audibly« click in place when securing it.

- Check the quick coupling for firm seating by pulling in the opposite direction!



Version 3

Quick coupling with front release button -arrow-.

- Press the release button -arrow- and detach the quick coupling.

Pay attention to the colour assignment when installing
⇒ [page 207](#) .

The quick coupling must »audibly« click in place when securing it.

- Check the quick coupling for firm seating by pulling in the opposite direction!



Version 4

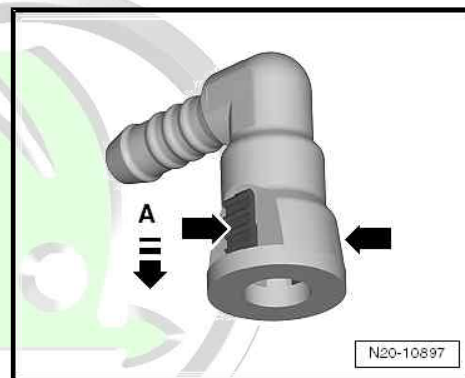
Quick coupling with release buttons -arrows- on right and left.

- Press quick coupling in -direction of arrow A-.
- Press release buttons -arrows- and detach quick coupling.

Pay attention to the colour assignment when installing
⇒ [page 207](#) .

The quick coupling must »audibly« click in place when securing it.

- Check the quick coupling for firm seating by pulling in the opposite direction!



Version 5

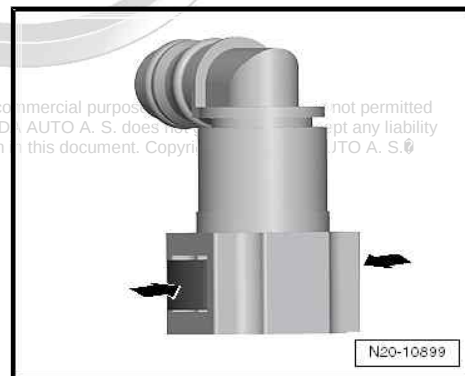
Quick coupling with release buttons -arrows- on right and left.

- Press release buttons -arrows- and detach quick coupling.

Pay attention to the colour assignment when installing
⇒ [page 207](#) .

The quick coupling must »audibly« click in place when securing it.

- Check the quick coupling for firm seating by pulling in the opposite direction!



Version 6

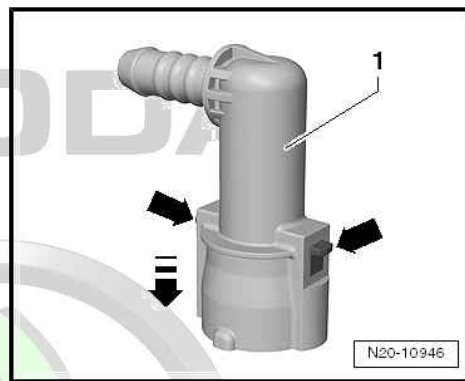
Quick coupling with release buttons -arrows- on right and left.

- Push quick coupling -1- in -direction of arrow- and maintain pressure.
- Press release buttons -arrows- and detach quick coupling.

Pay attention to the colour assignment when installing
⇒ [page 207](#) .

The quick coupling must »audibly« click in place when securing it.

- Check the quick couplings for firm seating by pulling in the opposite direction!



Variant 7

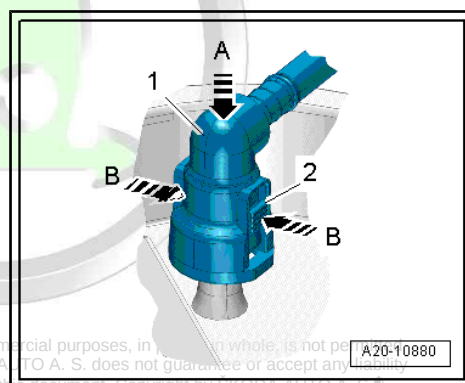
Quick coupling -1- with release buttons -arrows- right and left.

- Push quick coupling -1- in -direction of arrow A- and maintain pressure.
- Press release buttons -2- in -arrow direction B- and remove quick coupling - 1-.

Pay attention to the colour assignment when installing
⇒ [page 207](#) .

The quick coupling must »audibly« click in place when securing it.

- Check the quick couplings for firm seating by pulling in the opposite direction!



4 Fuel filter

⇒ [“4.1 Summary of components - fuel filter”, page 211](#)

4.1 Summary of components - fuel filter

1 - Fuel filter

- ☐ with installed pressure limiting valve for fuel re-turn-flow line

Opening pressure:
0.60...0.68 MPa
(6.0 ... 6.8 bar)

- ☐ do not interchange connections
- ☐ Fitting position
⇒ [Fig. “Fitting position of the fuel filter”](#),
[page 212](#)

2 - Fuel feed line

- ☐ black
- ☐ from fuel tank
- ☐ press in securing ring in order to unlock

3 - Fuel return-flow line

- ☐ blue
- ☐ to fuel tank
- ☐ release
⇒ [“3.1 Separating quick couplings”, page 207](#)

4 - Fuel feed line

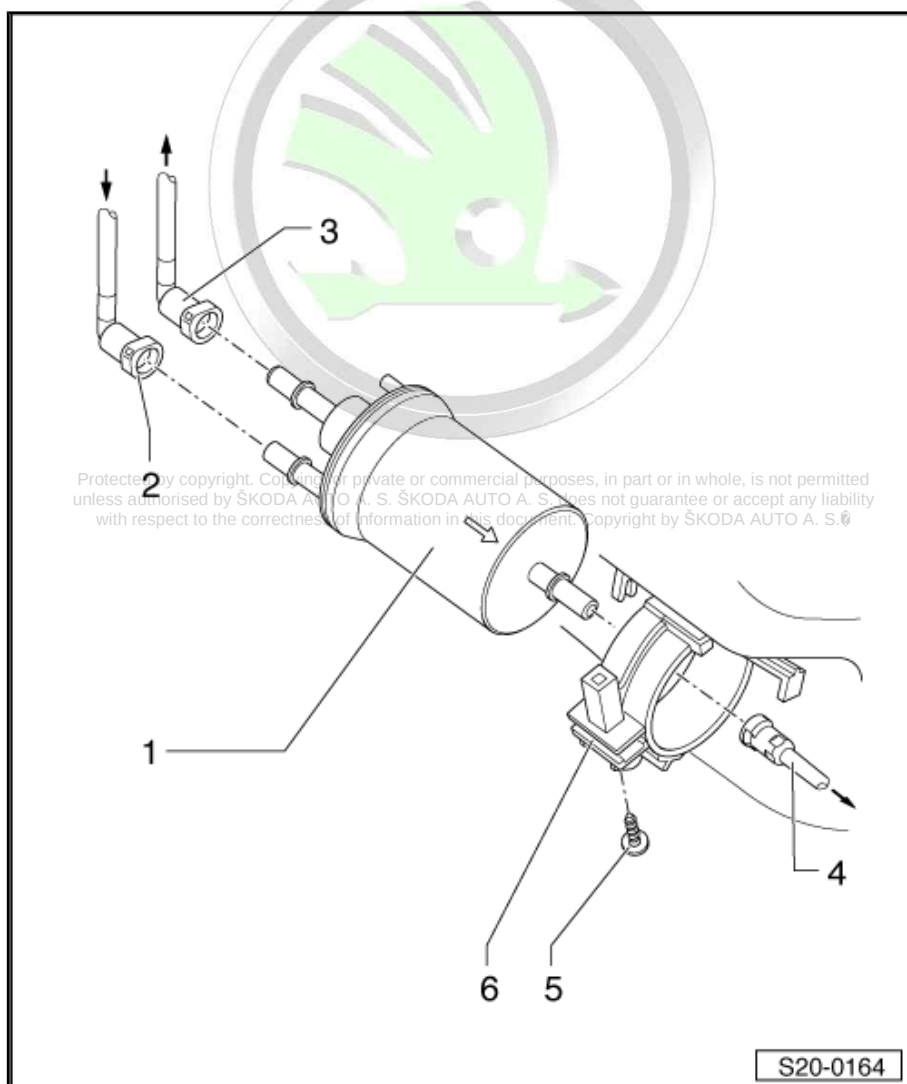
- ☐ black
- ☐ to the engine
- ☐ release
⇒ [“3.1 Separating quick couplings”, page 207](#)

5 - Screw

- ☐ 3 Nm

6 - Support

- ☐ for fuel filter
- ☐ attached to the fuel tank

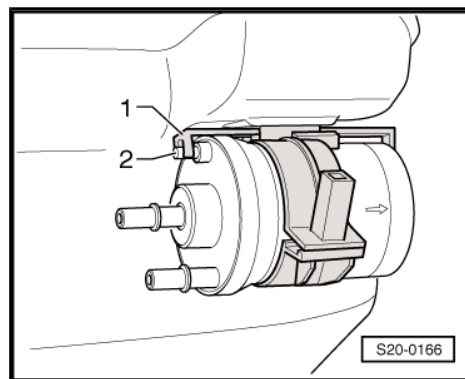




Fitting position of the fuel filter

The pin -2- at the filter housing must engage in the recess -1- of the bracket.

The direction of flow is marked by arrows.



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5 Activated charcoal filter system

⇒ [“5.1 Assembly overview - activated charcoal filter system”, page 213](#)

⇒ [“5.2 Checking the fuel tank venting”, page 216](#)

5.1 Assembly overview - activated charcoal filter system

⇒ [“5.1.1 Summary of components - activated charcoal filter system \(Octavia II, Superb II and Yeti\)”, page 213](#)

⇒ [“5.1.2 Summary of components - activated charcoal filter system \(Rapid NH\)”, page 215](#)

5.1.1 Summary of components - activated charcoal filter system (Octavia II, Superb II and Yeti)



Note

- ◆ *Hose connections are secured with either spring-type or clamp-type clips.*
- ◆ *Renew clamp-type clips with spring-type clips.*
- ◆ *Using the pliers for spring strap clips , for example -VAS 6340- , is recommended for assembling the spring strap clips.*
- ◆ *Safety precautions when working on the fuel supply system*
⇒ [“2.1 Safety precautions when working on fuel supply system”, page 3](#) .
- ◆ *Rules of cleanliness when working on the fuel supply system* ⇒ [“3.1 Rules of cleanliness”, page 8](#) .

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1 - Activated charcoal filter

- ☐ Fitting location: in right of engine compartment
- ☐ if the catch peg is unlocked, the activated charcoal filter can be removed from the holder
- ☐ Checking the fuel tank venting
⇒ "5.2 Checking the fuel tank venting", page 216

2 - Pressure holding valve with connection hose

3 - Screw

- ☐ 8 Nm

4 - Vent line

- ☐ check for firm seating
- ☐ from fuel tank

5 - Nut

- ☐ 8 Nm

6 - Support

- ☐ for activated charcoal filter

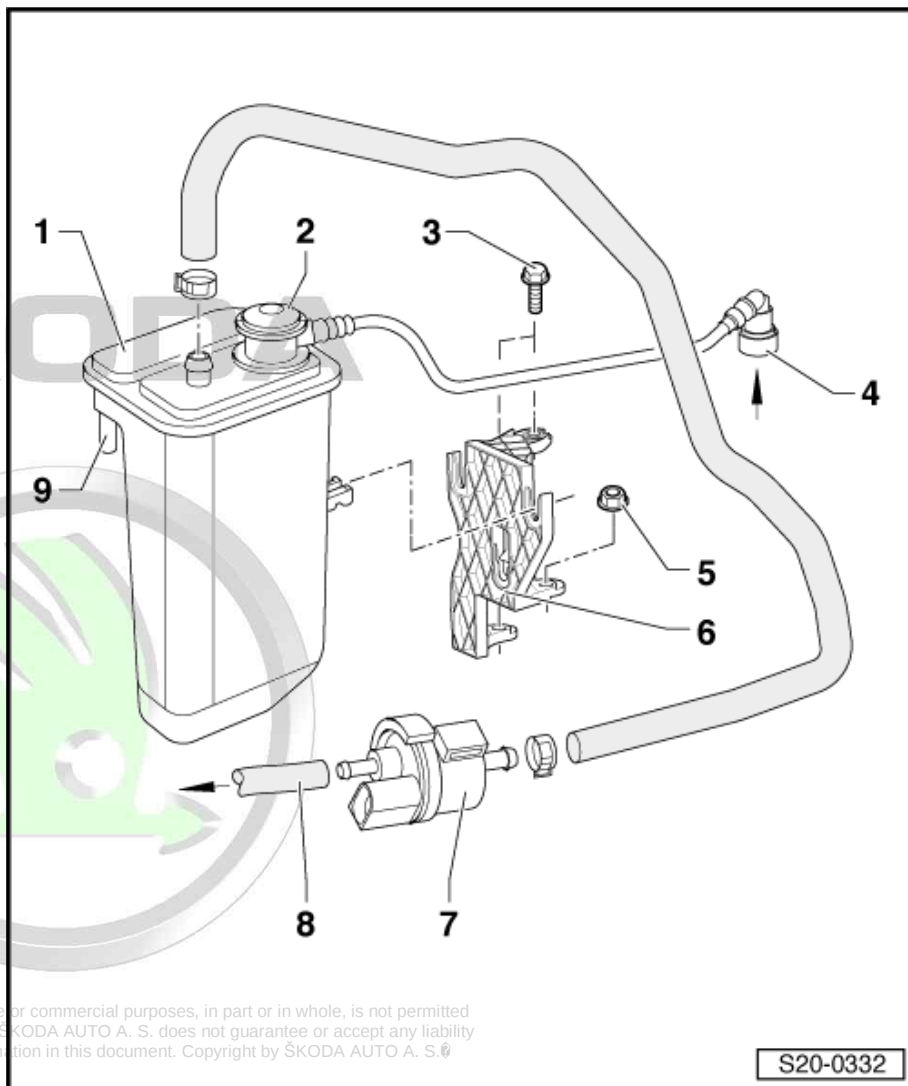
7 - Activated charcoal filter solenoid valve 1 - N80-

- ☐ Valve closed with ignition switched off.
- ☐ Valve is actuated (pulsed) by engine control unit - J623- when engine is warm

8 - Connecting hose

- ☐ To intake manifold
- ☐ check for firm seating

9 - Air admission fitting



S20-0332

5.1.2 Summary of components - activated charcoal filter system (Rapid NH)

1 - Bleeder hose

2 - Activated charcoal filter system solenoid valve 1 - N80- with connection line

- ☐ attached with bracket to the intake manifold
- ☐ Valve is actuated (pulsed) by engine control unit - J623- when engine is warm
- ☐ Valve closed with ignition switched off.

3 - to the non-return valve

4 - Intake manifold

5 - Activated charcoal filter

- ☐ Fitting location: in rear right wheelhouse
- ☐ attached to the vehicle body
- ☐ filled by solenoid valve - N80- and by gravity valve
- ☐ Checking the fuel tank venting
⇒ ["5.2 Checking the fuel tank venting", page 216](#)
- ☐ removing:
 - Removing the rear right wheel.

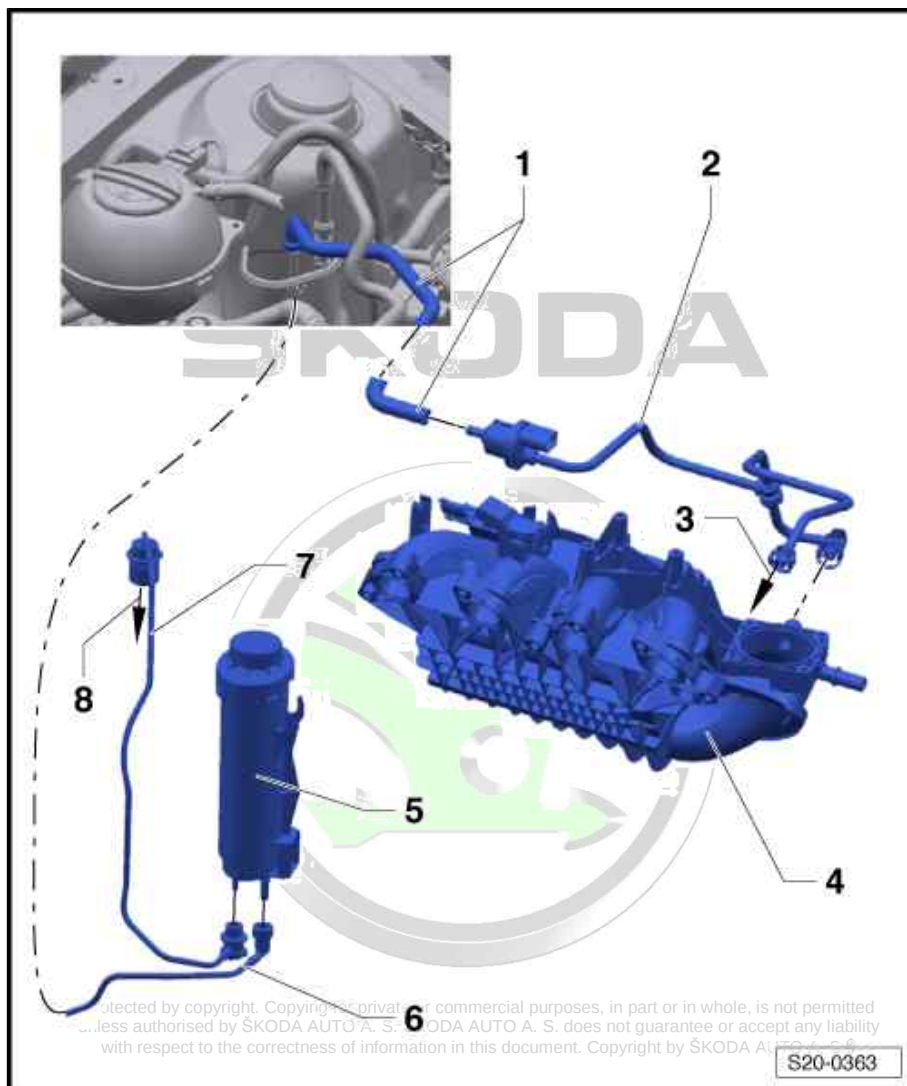
- Remove plastic wheel-house liner ⇒ Body Work; Rep. gr. 66 .
- Disconnect lines -6- and -7-.
- Remove the activated charcoal filter from the body and push down.

- ☐ Installing:
 - Installation is carried out in the reverse order.

6 - Vent line

7 - Vent line with gravity valve

8 - to fuel filler neck



5.2 Checking the fuel tank venting

⇒ "5.2.1 Checking fuel tank venting (Octavia II, Superb II and Yeti) .", page 216

⇒ "5.2.2 Checking the fuel tank venting (Rapid NH)", page 217

5.2.1 Checking fuel tank venting (Octavia II, Superb II and Yeti) .

Special tools and workshop equipment required

- ◆ Hand vacuum pump , e.g. -VAS 6213-
- ◆ Adapter set , e.g. -V.A.G 1318/17A-
- ◆ Adapter , e.g. -V.A.G 1318/20-1-



Note

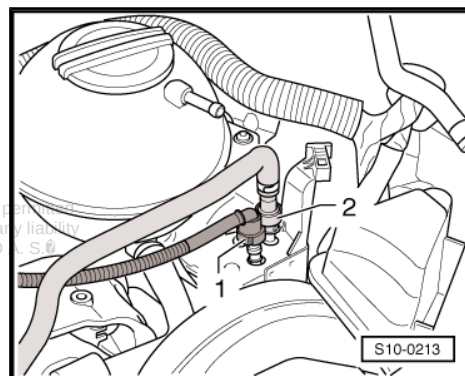
- ◆ The adapter set - V.A.G 1318/17A- replaces the adapter set - V.A.G 1318/17- .
- ◆ The figures shown in the description were not changed for this reason.

Test condition

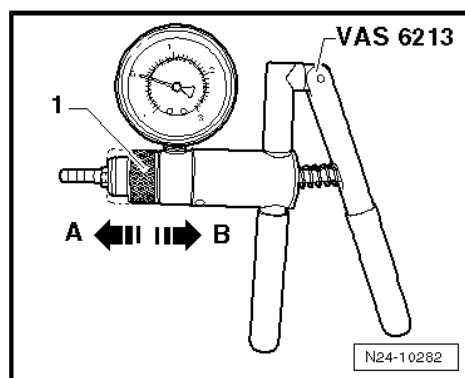
- Ignition must be switched off.

Test sequence

- Detach vent line -1-. To do so press in the securing ring.



- Put the sliding ring -1- of the hand vacuum pump - VAS 6213- in position -A- for "pressure".



- Then connect the hand vacuum pump - VAS 6213- -1- on the vent line -2- as shown in the figure.
- Operate hand vacuum pump - VAS 6213- several times.
- Vacuum must not build up.

If vacuum builds up:

- Check the air admission fitting on the activated charcoal filter for dirt and clean as required.

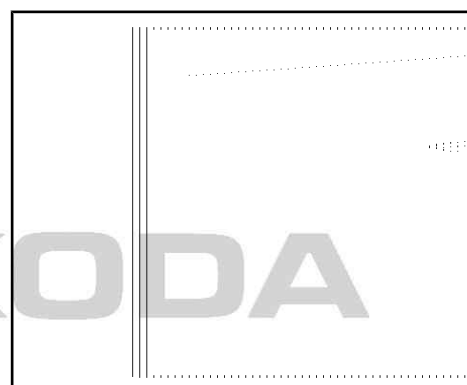
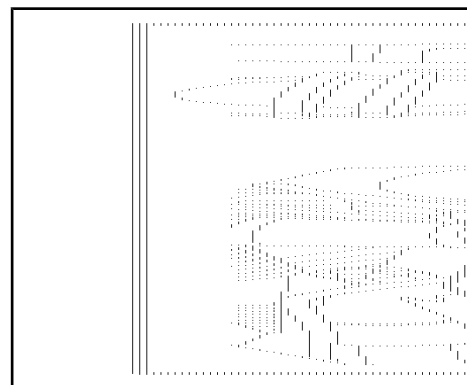
If vacuum does not build up:

- Shut off air admission fitting -arrow- and once again operate the hand vacuum pump several times.

- Vacuum must build up.

If vacuum does not build up:

- Replace activated charcoal filter.



5.2.2 Checking the fuel tank venting (Rapid NH)

Special tools and workshop equipment required

- ◆ Hand vacuum pump, e.g. - V.A.G. 1390- or Hand vacuum pump - VAS 6213-

Test condition

- Ignition must be switched off.
- Remove the ventilation line -1- from the activated charcoal filter to the activated charcoal filter system solenoid valve 1 - N80- -2-.
- Connect hand vacuum pump - VAS 6213- to vent line -1- as shown.
- Operate hand vacuum pump several times. Vacuum must not build up.

If vacuum builds up:

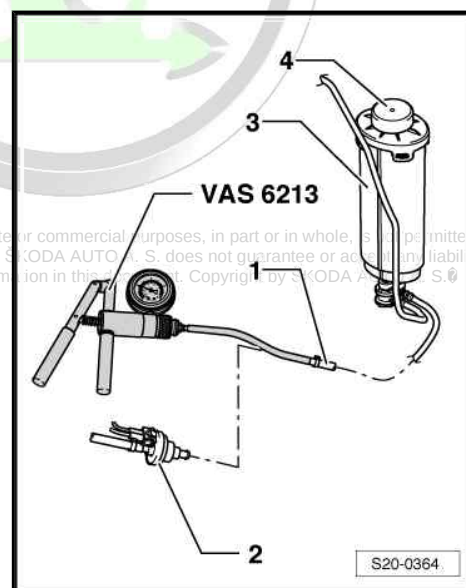
- Check the ventilation opening below the cover -4- on the activated charcoal filter -3- for dirt, clean as required.

If vacuum does not build up:

- Remove the cover -4-, shut off the ventilation opening on the activated charcoal filter and once again operate the hand vacuum pump several times. Vacuum must build up.

If vacuum does not build up:

- Replace activated charcoal filter.





6 Accelerator control

⇒ [“6.1 Assembly overview - accelerator module”, page 218](#)

⇒ [“6.2 Removing and installing accelerator pedal module with accelerator position sender G79 / G185”, page 219](#)

6.1 Assembly overview - accelerator module

⇒ [“6.1.1 Summary of components - accelerator pedal module \(Octavia II, Superb II, Yeti\)”, page 218](#)

⇒ [“6.1.2 Summary of components - accelerator module \(Rapid NH\)”, page 219](#)

6.1.1 Summary of components - accelerator pedal module (Octavia II, Superb II, Yeti)

1 - Connector

- ☐ Black, 6-pin.
- ☐ disconnect and fit on
⇒ [“6.2.2 Disconnect connector for accelerator pedal module and fit on”, page 221](#)

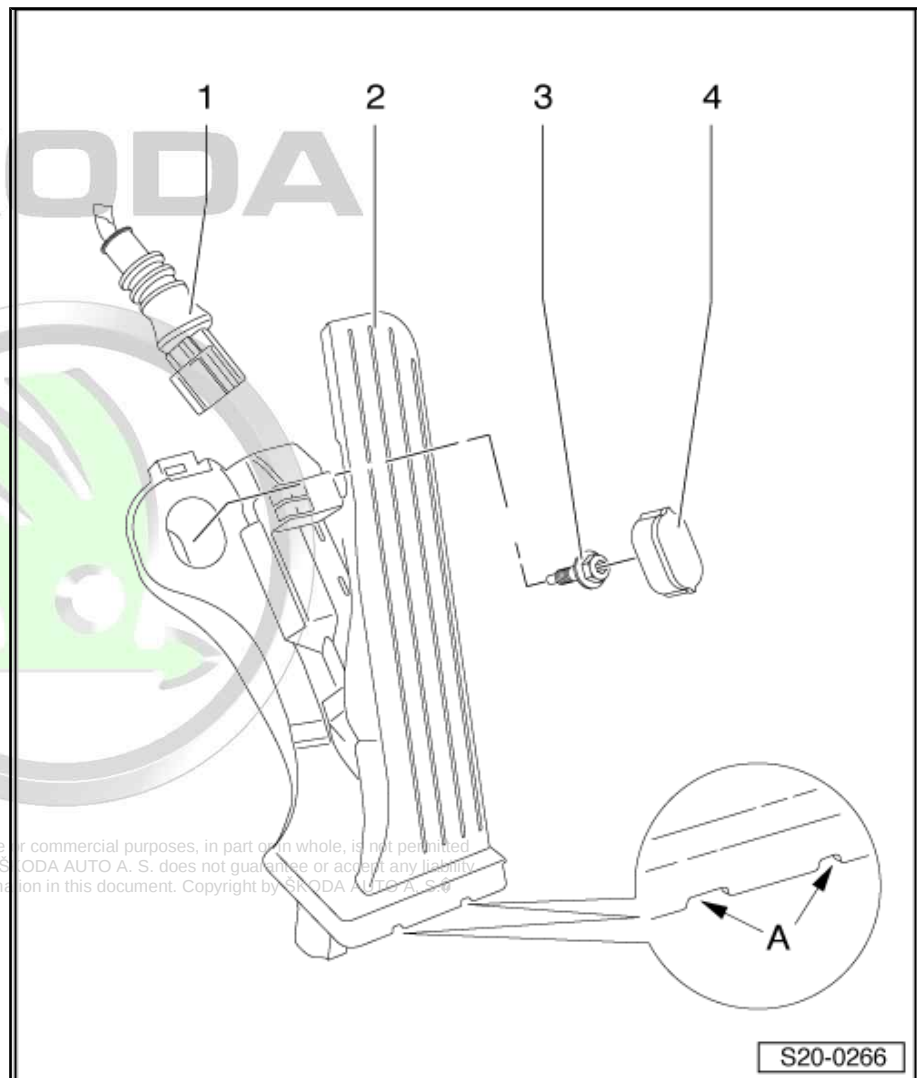
2 - Accelerator pedal position sender - G79- with accelerator pedal position sender 2 - G185-

- ☐ not adjustable
- ☐ -A- openings for the release tool
- ☐ removing and installing
⇒ [“6.2 Removing and installing accelerator pedal module with accelerator position sender G79 / G185”, page 219](#)
- ☐ on vehicles with automatic gearbox with kick-down switch
- ☐ After replacing in vehicles with automatic gearbox, adjust the engine and gearbox control unit ⇒ [Vehicle diagnostic tester](#)

3 - Screw

- ☐ 10 Nm

4 - Cap



6.1.2 Summary of components - accelerator module (Rapid NH)

1 - Bearing bracket

- ☐ removing and installing
⇒ Chassis; Rep. gr. 46

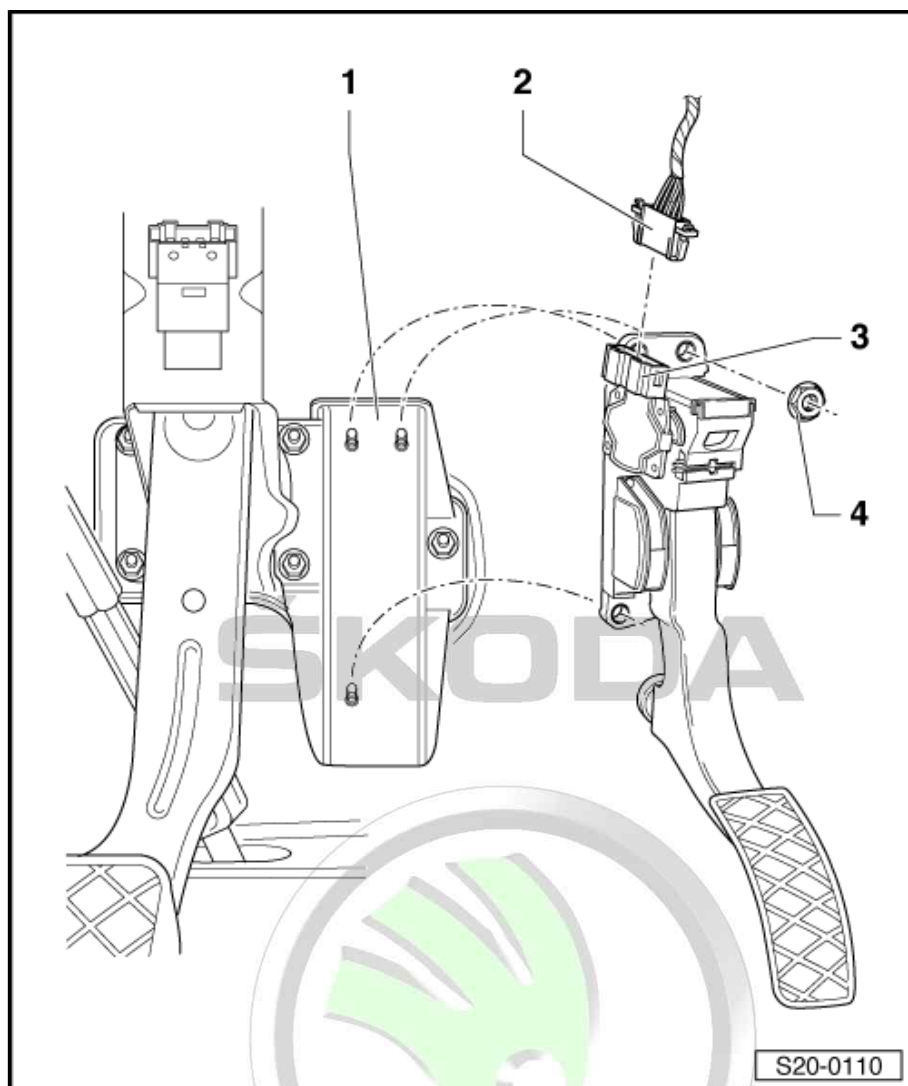
2 - Connector

- ☐ black
- ☐ 6-pin

3 - Accelerator pedal module

- ☐ with accelerator pedal position sender - G79- and accelerator pedal position sender 2 - G185-
- ☐ to remove the sender remove the bottom part of the dash panel on the driver's side
- ☐ If the accelerator pedal module is replaced, an adaptation of the engine control unit and gearbox has to be performed on vehicles with automatic gearbox ⇒ Vehicle diagnostic tester

4 - 10 Nm



6.2 Removing and installing accelerator pedal module with accelerator position sender -G79- / -G185-

⇒ ["6.2.1 Removing and installing accelerator pedal module with accelerator position sender G79 / G185", page 219](#)

⇒ ["6.2.2 Disconnect connector for accelerator pedal module and fit on", page 221](#)

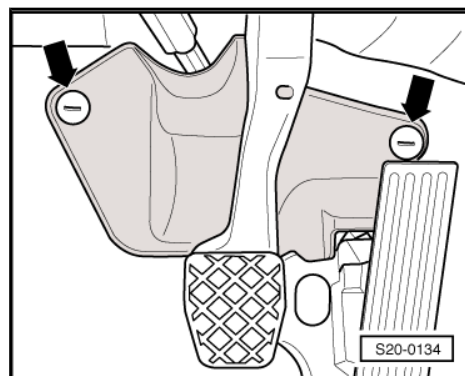
6.2.1 Removing and installing accelerator pedal module with accelerator position sender -G79- / -G185-

Special tools and workshop equipment required

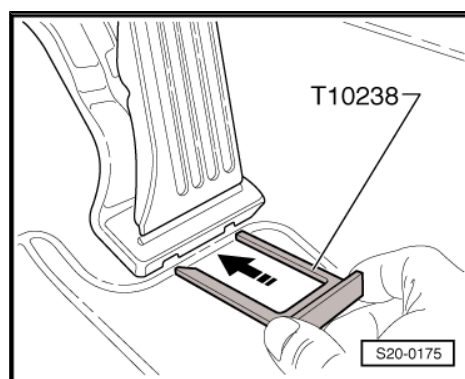
- ◆ Release tool - T10238- (for left-hand drive vehicle)
- ◆ Release tool - T10240- (for right-hand drive vehicle)

Removing

- Remove steering column cover -arrows-.
- Lever out the cap with a screwdriver ⇒ [Item 4 \(page 218\)](#) .
- Unscrew screw ⇒ [Item 3 \(page 218\)](#) .

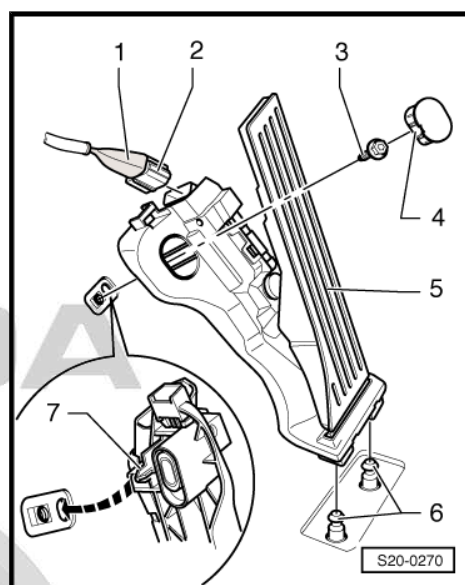


- Slide in the unlocking tool - T10238- (for right-hand drive unlocking tool - T10240-) as shown as far as it goes into the provided openings, and remove the gas pedal module.
- Disconnect connector at accelerator pedal module ⇒ [“6.2.2 Disconnect connector for accelerator pedal module and fit on”, page 221](#) .



Install

- Fit the plug -2- onto the accelerator pedal module -5- ⇒ [“6.2.2 Disconnect connector for accelerator pedal module and fit on”, page 221](#) .
- Push accelerator pedal module onto the fixing bolts -6-.
- Insert the centering pin -7- into the hole in the underbody.
- Screw on accelerator pedal module with fixing screw -3- and fit the cap -4-.
- Install steering column cover.
- If the accelerator pedal module was replaced on vehicles with automatic gearbox, the engine control unit must be adapted ⇒ Vehicle diagnostic tester.



Tightening torques

- ♦ ⇒ [“6.1.1 Summary of components - accelerator pedal module \(Octavia II, Superb II, Yeti\)”, page 218](#)

6.2.2 Disconnect connector for accelerator pedal module and fit on



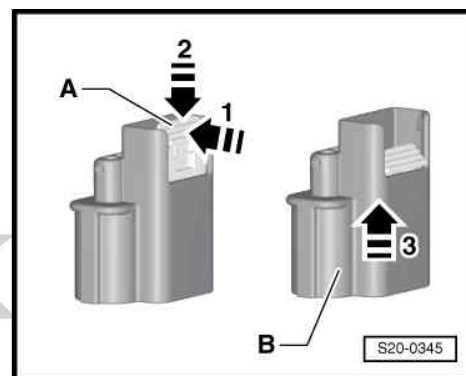
Note

The plugs for the accelerator pedal module which are inserted, must be disconnected and fit on in a different manner.

Disconnect connector 1K0 973 706

- Slightly press the piston slide valve -A- (grey) in -direction of arrow 1- and push it up to the stop in -direction of arrow 2-.
- Hold the piston slide valve in this position and disconnect the socket housing -B- towards the top in -direction of arrow 3-.

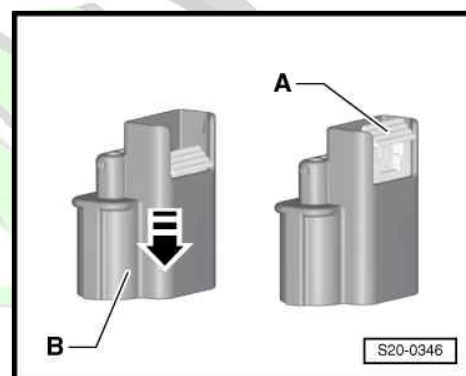
The piston slide valve -A- remains in the bottom position.



Fit on connector 1K0 973 706

- Push the socket housing -B- down in -direction of arrow- until the housing can be heard to lock in place.
- For safety reasons, check the connector for secure catch by tightening it in the opposite direction.

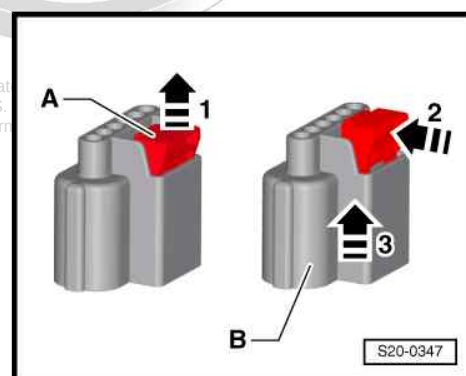
The piston slide valve -A- moves automatically upwards.



Disconnect connector 8K0 973 706

- Pull the piston slide valve -A- (red) upwards in -direction of arrow 1- up to the stop.
- Press the piston slide valve in -direction of arrow 2- and disconnect the socket housing -B- upwards in -direction of arrow 3-.

The piston slide valve -A- remains in the top position.

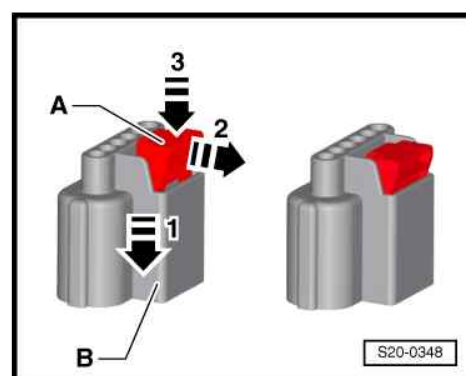


Fit on connector 8K0 973 706

- Push the socket housing -B- downwards up to the stop in -direction of arrow 1-.
- Lightly press the piston slide valve in -direction of arrow 2- and slide in -direction of arrow 3-.

The piston slide valve -A- can only be pushed downwards if the socket housing was pushed downwards »up to the stop«.

- For safety reasons, check the connector for secure catch by tightening it in the opposite direction.





7 Fuel system pressurisation pump

⇒ ["7.1 Checking the fuel pump for predelivery system G6", page 222](#)

7.1 Checking the fuel pump for predelivery system - G6-

⇒ ["7.1.1 Checking function and voltage supply", page 222](#)

⇒ ["7.1.2 Checking fuel pressure", page 224](#)

⇒ ["7.1.3 Testing holding pressure", page 226](#)

⇒ ["7.1.4 Check fuel flow rate", page 228](#)

⇒ ["7.1.5 Checking current draw", page 232](#)

7.1.1 Checking function and voltage supply

Special tools and workshop equipment required

- ◆ Voltage tester , e. g. -V.A.G 1527B-

Test conditions

- Battery voltage at least 11.5 V.
- Fuel pump fuse O.K. ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.
- Fuel pump control unit - J538- OK.

Test sequence



Note

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Function of fuel pump is checked using final control diagnosis.

- Connect ⇒ Vehicle diagnostic tester.
- Switch on ignition.
- Press the following buttons in sequence:
 - ◆ Vehicle self-diagnosis
 - ◆ Engine electronics
 - ◆ Final control diagnosis
 - ◆ Electric fuel pump
 - ◆ ▶
 - ◆ Button
- The fuel pump must now run slowly to the maximum speed.



Note

The fuel pump runs very quietly.

- Switch off ignition.

If the fuel pump does not run:

For vehicles Octavia II, Superb II and Rapid NH

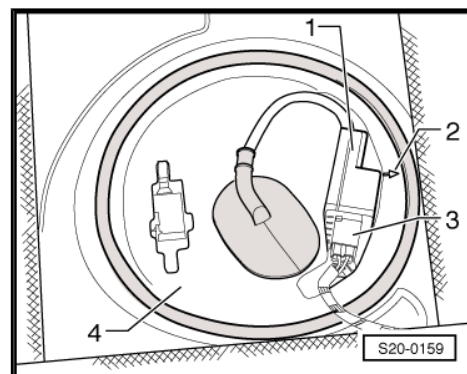
- Removing rear seat bench ⇒ Body Work; Rep. gr. 72 .

For vehicles Yeti

- Remove rear seat bench with brackets ⇒ Body Work; Rep. gr. 72 .
- Remove floor covering under the rear seats.

Continued for all vehicles

- Disconnect plug -3- from fuel pump control unit - J538- .



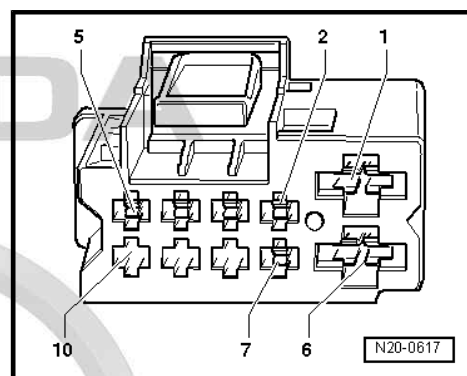
- Testing the voltage supply with the voltage tester - V.A.G 1527B- between contact -1- and -6-.

- The LED must light up.

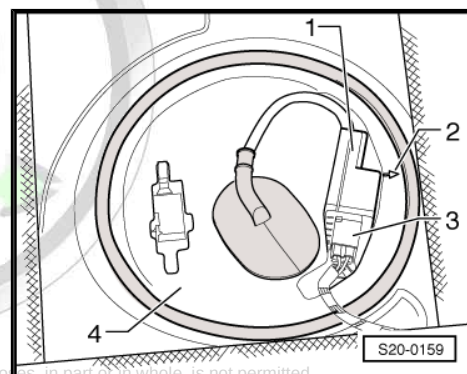
The LED does not light up:

- Locate and eliminate open circuit referring to current flow diagram ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.

The LED lights up (power supply O.°K.):



- Unclip the cover -4- with the fuel pump control unit - J538- -1-.



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- First of all check the plug -1- for correct fit. To do so, pull on the plug without pressing the catch.

If the plug was not correctly plugged in:

- Repeat the functional test of the fuel pump.

If the plug was correctly plugged in:

- Now unplug the plug -1-.
- Check contacts on plug and on fuel pump for damage.

If no damage was detected:

- Remove fuel delivery unit:

- ♦ Octavia II, Yeti
⇒ [“2.1.1 Removing and installing fuel delivery unit/fuel gauge sender \(Octavia II, Yeti\)”](#), page 195 .

- ♦ Superb II
⇒ [“2.1.2 Removing and installing fuel delivery unit/fuel gauge sender \(Superb II\)”](#), page 197 .

- ♦ Rapid NH
⇒ [“2.1.3 Removing and installing the fuel delivery unit/fuel gauge sender \(Rapid NH\)”](#), page 200 .

- Check that electrical wires between flange and fuel pump are connected.

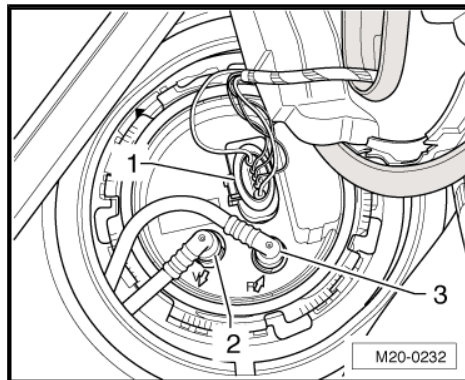
If there is no open circuit in the wiring, the fuel pump is defective.

- Replace fuel delivery unit:

- ♦ Octavia II, Yeti
⇒ [“2.1.1 Removing and installing fuel delivery unit/fuel gauge sender \(Octavia II, Yeti\)”](#), page 195 .

- ♦ Superb II
⇒ [“2.1.2 Removing and installing fuel delivery unit/fuel gauge sender \(Superb II\)”](#), page 197 .

- ♦ Rapid NH
⇒ [“2.1.3 Removing and installing the fuel delivery unit/fuel gauge sender \(Rapid NH\)”](#), page 200 .



7.1.2 Checking fuel pressure

Special tools and workshop equipment required

- ♦ Pressure gauge , e.g. -VAS 6550-
- The function of the fuel pump was checked
⇒ [“7.1.1 Checking function and voltage supply”](#), page 222 .



Note

- ♦ *Safety precautions when working on the fuel supply system*
⇒ [“2.1 Safety precautions when working on fuel supply system”](#), page 3 .

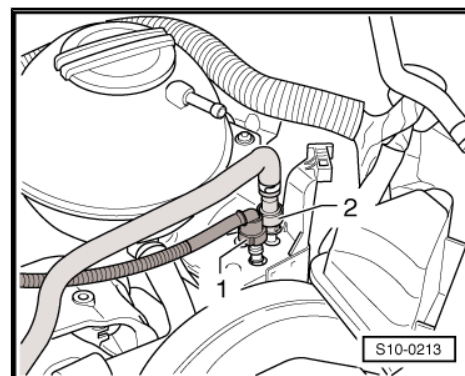
- ♦ *Rules of cleanliness when working on the fuel supply system*
⇒ [“3.1 Rules of cleanliness”](#), page 8 .

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For vehicles Octavia II, Superb II, Yeti

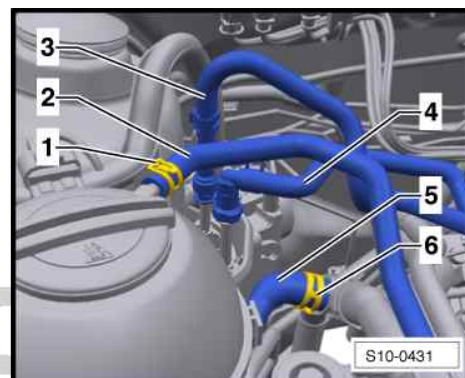
- Disconnect fuel supply line -2-
⇒ [“3.1 Separating quick couplings”, page 207](#) .

For Rapid NH vehicles



- Disconnect fuel supply line -3-
⇒ [“3.1 Separating quick couplings”, page 207](#) .

Continued for all vehicles



- Connect the pressure gauge - VAS 6550- with adapters - VAS 6550/1- and -VAS 6550/2- to the fuel feed line.
- Make sure that drain tap is closed and cut-off taps are open.
- Switch the ignition on and off so often until the fuel pressure on the pressure gauge does no longer rise.
- Read off fuel pressure on pressure gauge.
- Specified value: 0.35...0.7 MPa (3.5 ... 7 bar)

If fuel line is o.k.:

- Test holding pressure
⇒ [“7.1.3 Testing holding pressure”, page 226](#) .

If the specification is exceeded:

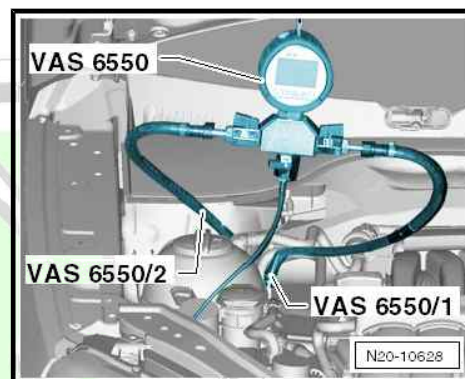
- Check the fuel return line between the fuel filter and fuel pump for kinks and blockages.

If no errors are detected the pressure limiting valve in the fuel filter is defective:

- Replace fuel filter.

If the measurement is less than the specification:

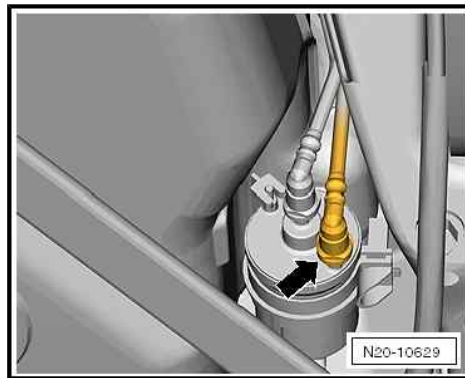
- Check the fuel pressure before the fuel filter, to do so proceed as follows:



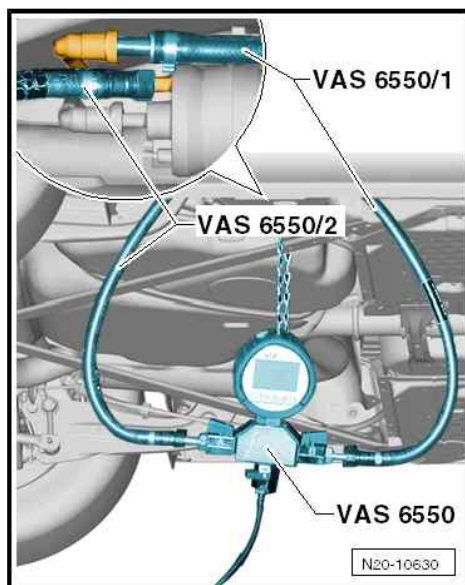
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- Disconnect fuel feed line -arrow- at fuel filter.



- Connect the pressure gauge - VAS 6550- with the adapter - VAS 6550/1- and -VAS 6550/2- between the fuel filter and the fuel feed line.
- Make sure that drain tap is closed and cut-off taps are open.
- Start engine and run in idle.



- Slowly close the shutoff cock -A- on the pressure gauge - VAS 6550- -1-.
- The pressure must rise to at least 0.7 MPa (7.0 bar).
- If the 0.7 MPa (7.0 bar) is reached, immediately open the shut-off cock again!

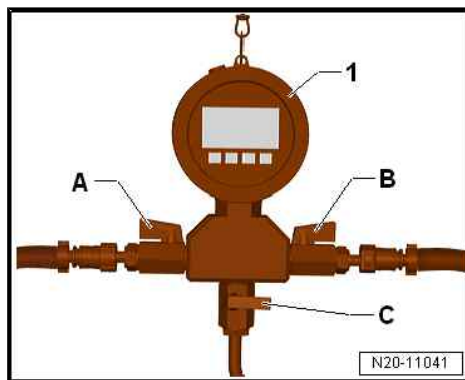
If the pressure has risen, the fuel pump is OK but the pressure limiting valve in the fuel filter is defective:

- Replace fuel filter.

If the pressure has not risen, the fuel pump is defective:

- Replace fuel delivery unit:

- ♦ Octavia II, Yeti
⇒ [“2.1.1 Removing and installing fuel delivery unit/fuel gauge sender \(Octavia II, Yeti\)”, page 195](#) .
- ♦ Superb II
⇒ [“2.1.2 Removing and installing fuel delivery unit/fuel gauge sender \(Superb II\)”, page 197](#) .
- ♦ Rapid NH
⇒ [“2.1.3 Removing and installing the fuel delivery unit/fuel gauge sender \(Rapid NH\)”, page 200](#) .



7.1.3 Testing holding pressure

Special tools and workshop equipment required

- ♦ Pressure gauge , e.g. -VAS 6550-

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- Fuel pressure O.K. and pressure gauge - VAS 6550- connected in the engine compartment
⇒ ["7.1.2 Checking fuel pressure", page 224](#) .



Note

- ♦ *Safety precautions when working on the fuel supply system*
⇒ ["2.1 Safety precautions when working on fuel supply system", page 3](#) .
- ♦ *Rules of cleanliness when working on the fuel supply system*
⇒ ["3.1 Rules of cleanliness", page 8](#) .
- Switch the ignition on and off so often until the fuel pressure on the pressure gauge does no longer rise.
- Read off fuel pressure on pressure gauge.
- Specified value: 0.35...0.7 MPa (3.5 ... 7 bar)
- Observe pressure drop at pressure gauge.
- The pressure must not drop below 0.3 MPa (3.0 bar) after 10 minutes.

If the pressure still drops:

- Switch the ignition on and off so often until the fuel pressure on the pressure gauge does no longer rise.
- After pressure has built up, cut-off tap -B- of pressure tester immediately. Lever is then at right angle to direction of flow.

If the pressure does not drop now:



Note

Search for leak on engine side. Repeat holding pressure check. This time, close the shut-off cock -A- in order to determine if a leak is indeed present on the engine side.

- Check the low-pressure line to the high pressure pump for tightness.

If no fault is found:

- Replace high pressure pump
⇒ ["7.2 Removing and installing the high pressure pump", page 299](#) .

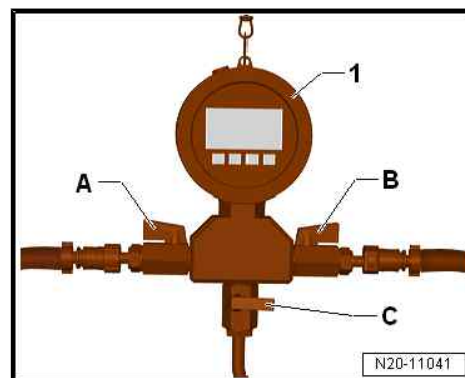
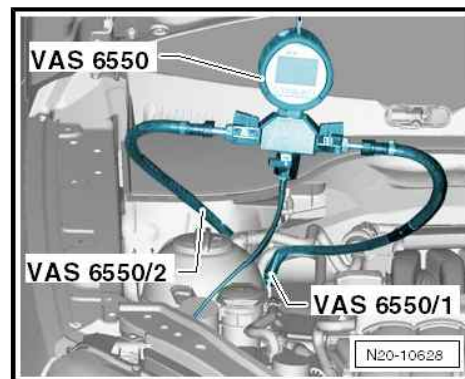
If the pressure drops again:

Leak must be sought on fuel tank side; proceed as follows:

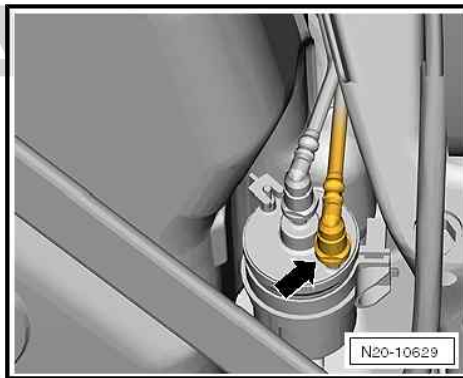
- Check the fuel line to the fuel filter for tightness.

If the fuel line is not found to be faulty:

- Check the pressure holding valve in the fuel delivery unit. To do so proceed in the following manner:

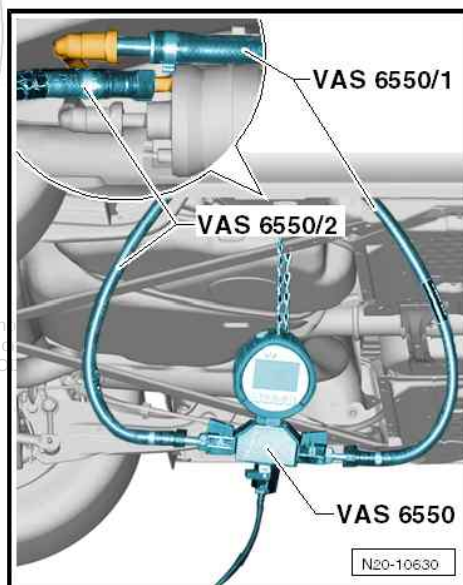


- Disconnect fuel feed line -arrow- at fuel filter.



- Connect the pressure gauge - VAS 6550- with the adapter - VAS 6550/1- and -VAS 6550/2- between the fuel filter and the fuel feed line.
- Make sure that drain tap is closed and cut-off taps are open.
- Switch the ignition on and off so often until the fuel pressure on the pressure gauge does no longer rise.
- Read off fuel pressure on pressure gauge.
- Specified value: 0.35...0.7 MPa (3.5 ... 7 bar)

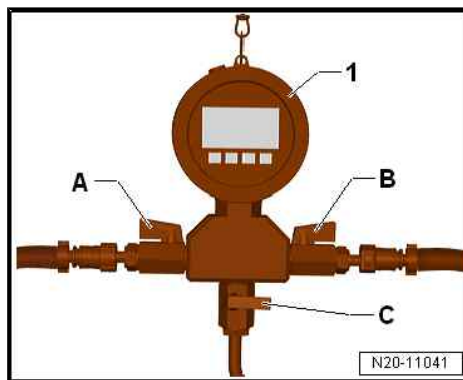
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- After the pressure has built up, close the shut-off cock -A-.
- Observe pressure drop at pressure gauge.
- The pressure must not drop below 0.3 MPa (3.0 bar) after 10 minutes.

If the pressure drops, the non-return valve in the fuel pump is defective:

- Replace fuel delivery unit:
- ♦ Octavia II, Yeti
⇒ ["2.1.1 Removing and installing fuel delivery unit/fuel gauge sender \(Octavia II, Yeti\)", page 195](#) .
- ♦ Superb II
⇒ ["2.1.2 Removing and installing fuel delivery unit/fuel gauge sender \(Superb II\)", page 197](#) .
- ♦ Rapid NH
⇒ ["2.1.3 Removing and installing the fuel delivery unit/fuel gauge sender \(Rapid NH\)", page 200](#) .



If the pressure does not drop, the pressure limiting valve in the fuel filter is defective:

- Replace fuel filter.

7.1.4 Check fuel flow rate

Special tools and workshop equipment required

- ♦ Pressure gauge , e.g. -VAS 6550-

- ◆ Remote control , e.g. -V.A.G 1348/3A- with adapter cable , e.g. -V.A.G 1348/3-3-
- ◆ Adapter for measuring method/DSO (5-pin) , e.g. -VAS 5565-
- ◆ Multimeter , e.g. -V.A.G 1715-
- ◆ Measuring glass



Note

- ◆ *Safety precautions when working on the fuel supply system*
⇒ *"2.1 Safety precautions when working on fuel supply system", page 3* .
- ◆ *Rules of cleanliness when working on the fuel supply system*
⇒ *"3.1 Rules of cleanliness", page 8* .
- Switch off ignition and all electrical loads, and pull out ignition key.

For vehicles Octavia II, Superb II and Rapid NH

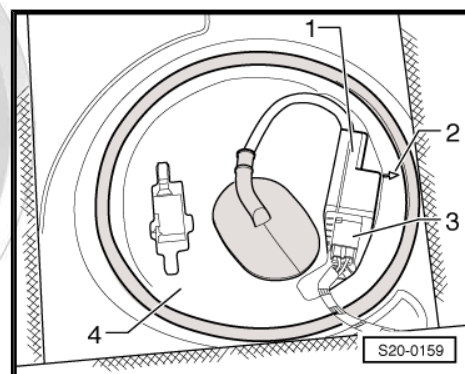
- Removing rear seat bench ⇒ Body Work; Rep. gr. 72 .

For vehicles Yeti

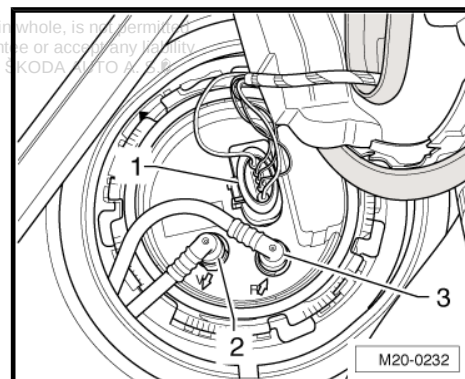
- Remove rear seat bench with brackets ⇒ Body Work; Rep. gr. 72 .
- Remove floor covering under the rear seats.

Continued for all vehicles

- Unclip the cover -4- with the fuel pump control unit - J538-1-.



- First of all check the plug -1- for correct fit. To do so, pull on the plug without pressing the catch. If the plug was not correctly plugged in, it may have caused a fault.
- Now unplug the plug -1-.
- Check contacts on plug and on fuel pump for damage.





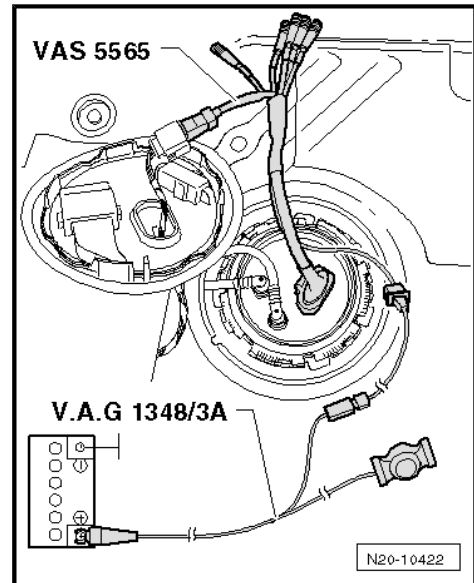
- Connect test instrument adapter/DSO (5-pin) - VAS 5565- to connector and fuel delivery unit.
- Connect the remote control - V.A.G 1348/3A- to the adapter - VAS 5565- and to the battery positive (+).



Note

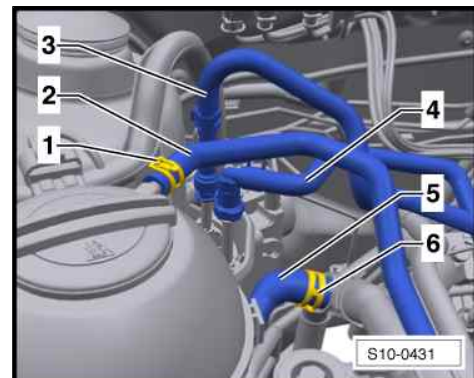
This step is only intended to ensure that the fuel pump runs when the engine is switched off.

For vehicles Rapid NH



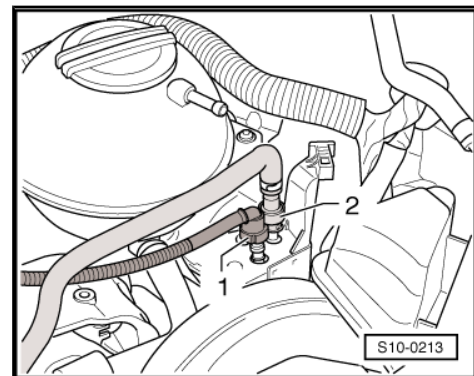
- Disconnect the fuel feed line -3- ➔ [“3.1 Separating quick couplings”, page 207](#) and catch the fuel which flows out with a cloth.

For vehicles Octavia II, Superb II, Yeti



- Disconnect the fuel feed line -2- ➔ [“3.1 Separating quick couplings”, page 207](#) and catch the fuel which flows out with a cloth.

Continued for all vehicles

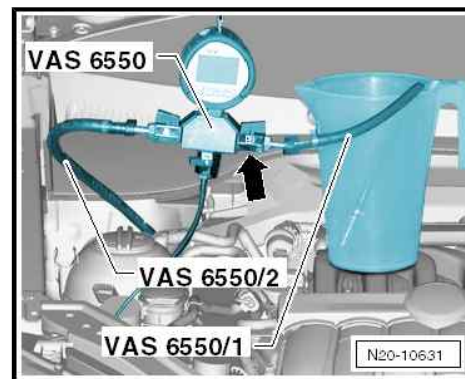


- Connect pressure tester - VAS 6550- to fuel supply line with adapter - VAS 6550/2- . Hold adapter - VAS 6550/1- in a measuring vessel.
- Make sure that drain tap is closed and cut-off taps are open.

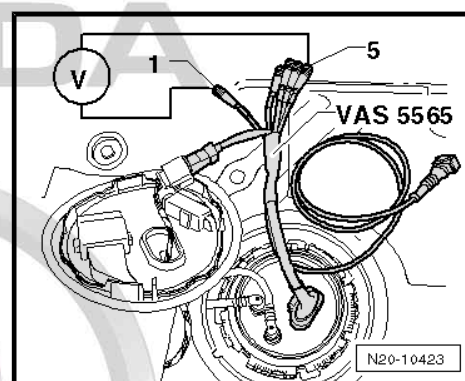


WARNING

Danger of liquid spraying out when opening the shut-off valve. Wear safety goggles and safety clothing, in order to avoid injuries and skin contact with fuel. Hold the container in front of the free connection to the pressure gauge.



- Operate remote control - V.A.G 1348/3A- . While doing this, slowly close the shut-off cock -arrow- until the pressure gauge displays 0.4 MPa (4 bar) overpressure. From this point on do not move position of shut-off tap.
- Empty measuring glass.
- The fuel flow rate of the fuel pump is dependent on the battery voltage. For this reason, additionally connect the multimeter - V.A.G 1715- to the outgoing circuits -1- and -5- of the adapter for measuring method/DSO (5-pin) - VAS 5565- .
- Activate remote control for 30 seconds while measuring the battery voltage.



- Compare the fuel rate with the specified value.

*) Minimum delivery quantity 1 cm³/30 seconds.

**) Voltage at the fuel pump when engine is not running and pump is operating.

Read out examples:

During the test a voltage of 10.5 V was measured. Thus a minimum flow rate of 580 cm³/30 s is obtained.

If the minimum flow rate is not reached:

- Check fuel lines for possible restrictions (kinks) or blockages.

If no fault is found:

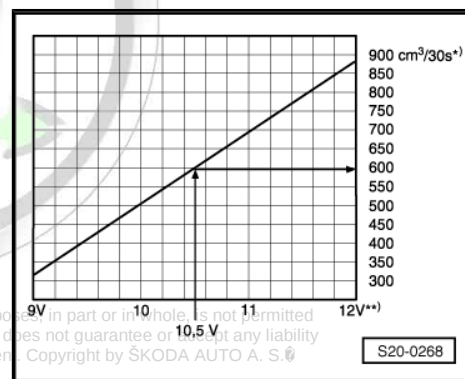
- Take cap off fuel filler neck and repeat the test.

If the fuel flow rate is now reached:

- Check the ventilation of the fuel tank.

If the minimum delivery rate is again not attained

- Check the fuel filter, to do so proceed as follows:



- Disconnect fuel feed line -arrow- at fuel filter.



- Connect pressure tester - VAS 6550- to fuel supply line with adapter - VAS 6550/1- . Hold adapter - VAS 6550/2- in a measuring vessel.
- Make sure that drain tap is closed and cut-off taps are open.
- Repeat delivery rate check.

If the minimum delivery rate is now attained:

- Replace fuel filter.

If the minimum delivery rate is again not attained

- Remove fuel delivery unit and inspect filter strainer for soiling.

Only if no fault has yet been detected:

- Replace fuel delivery unit:

- ◆ Octavia II, Yeti

⇒ [“2.1.1 Removing and installing fuel delivery unit/fuel gauge sender \(Octavia II, Yeti\)”, page 195](#) .

- ◆ Superb II

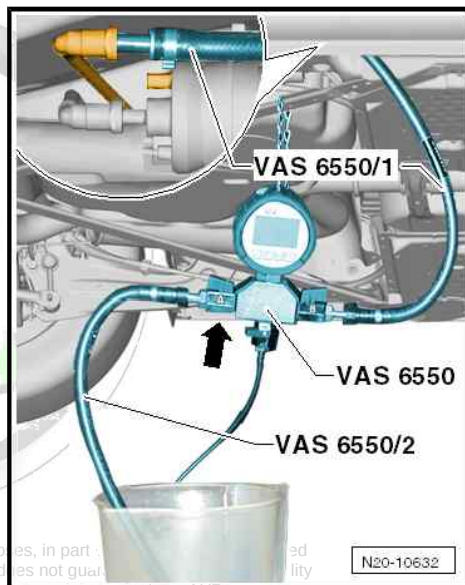
⇒ [“2.1.2 Removing and installing fuel delivery unit/fuel gauge sender \(Superb II\)”, page 197](#) .

- ◆ Rapid NH

⇒ [“2.1.3 Removing and installing the fuel delivery unit/fuel gauge sender \(Rapid NH\)”, page 200](#) .

If the required fuel flow rate has been achieved, but a fault is still suspected in the fuel supply system (e.g. intermittent breakdown of the fuel supply):

- Check current consumption of fuel pump
⇒ [“7.1.5 Checking current draw”, page 232](#) .



7.1.5 Checking current draw

Special tools and workshop equipment required

- ◆ Adapter for measuring method/DSO (5-pin) , e.g. -VAS 5565-

For vehicles Octavia II, Superb II and Rapid NH

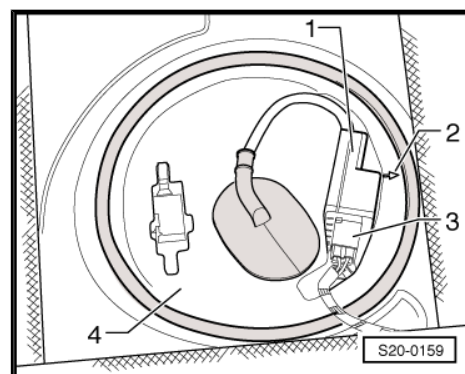
- Removing rear seat bench ⇒ Body Work; Rep. gr. 72 .

For vehicles Yeti

- Remove rear seat bench with brackets ⇒ Body Work; Rep. gr. 72 .
- Remove floor covering under the rear seats.

Continued for all vehicles

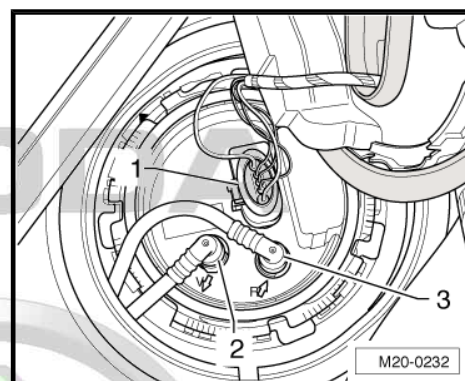
- Unclip the cover -4- with the fuel pump control unit - J538- -1-.



- First of all check the plug -1- for correct fit. To do so, pull on the plug without pressing the catch. If the plug was not correctly plugged in, it may have caused a fault.
- Now unplug the plug -1-.
- Check contacts on plug and on fuel delivery unit for damage.

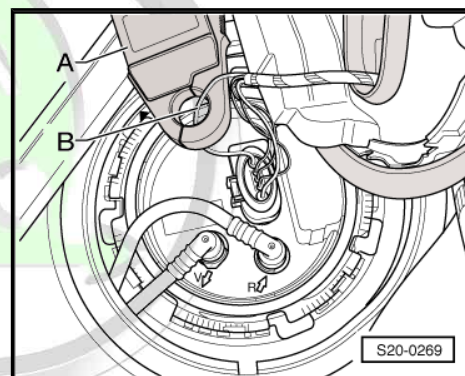
If no damage was detected:

- Put plug -1- back into place.



- Connect the current probe -A- of the vehicle diagnosis, measurement and information system (VAS) on the line -B- to contact 1 of the 5-pin plug.

If the current probe cannot be connected on the line -B- to contact 1 of the 5-pin plug because of the length of the insulation:



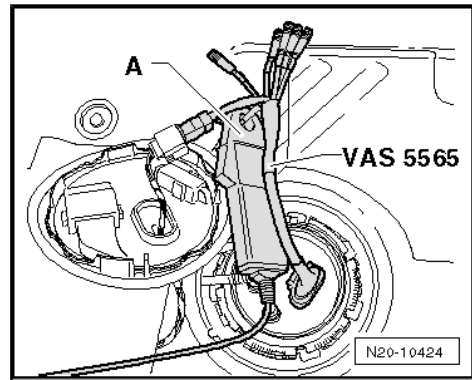
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- Connect test instrument adapter/DSO (5-pin) - VAS 5565- to connector and fuel delivery unit.
- Connect the current probe -A- on the red cable - with the inscription "current probe" - of the adapter for measuring method/DSO (5-pin) - VAS 5565- .

Continued for all vehicles

- Start engine and run in idle.
 - Measure current draw of fuel pump.
- Specified value: max. 9 A



Note

If the fault in the fuel supply system is intermittent then tests can be undertaken during a test drive but then two people are required for this.

If the power consumption is exceeded, the fuel pump is defective:

- Replace fuel delivery unit:
- ◆ Octavia II, Yeti
⇒ ["2.1.1 Removing and installing fuel delivery unit/fuel gauge sender \(Octavia II, Yeti\)", page 195](#) .
- ◆ Superb II
⇒ ["2.1.2 Removing and installing fuel delivery unit/fuel gauge sender \(Superb II\)", page 197](#) .
- ◆ Rapid NH
⇒ ["2.1.3 Removing and installing the fuel delivery unit/fuel gauge sender \(Rapid NH\)", page 200](#) .

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21 – Turbocharging/supercharging

1 Exhaust gas turbocharger

⇒ [“1.1 Summary of components - exhaust gas turbocharger”, page 235](#)

⇒ [“1.2 Removing and installing exhaust gas turbocharger”, page 238](#)

⇒ [“1.3 Testing exhaust turbocharger pressure box”, page 246](#)

⇒ [“1.4 Adjusting exhaust turbocharger pressure box”, page 248](#)

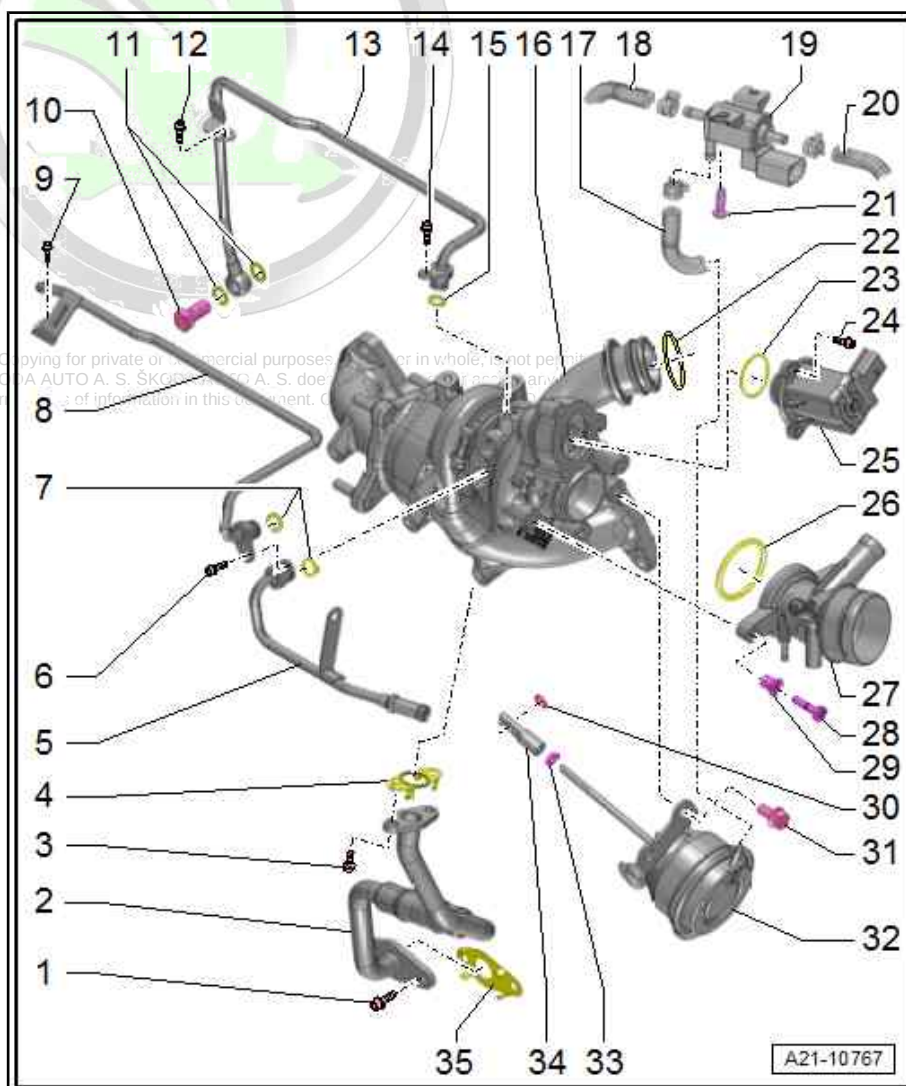
1.1 Summary of components - exhaust gas turbocharger

⇒ [“1.1.1 Summary of components - exhaust gas turbocharger 1”, page 235](#)

⇒ [“1.1.2 Summary of components - exhaust gas turbocharger 2”, page 237](#)

1.1.1 Summary of components - exhaust gas turbocharger 1

- 1 - Screw
☐ 8 Nm
- 2 - Oil return-flow line
- 3 - Screw
☐ 8 Nm
- 4 - Gasket
☐ Replace after disassembly
- 5 - Coolant feed line
- 6 - Screw
☐ 11 Nm
- 7 - O-ring
☐ Replace after disassembly
- 8 - Coolant return-flow line
- 9 - Screw
☐ 8 Nm
- 10 - Hollow screw
☐ Replace after disassembly
☐ 30 Nm
- 11 - Sealing ring
☐ Replace after disassembly
- 12 - Screw
☐ 8 Nm





13 - Oil feed line

14 - Screw

- ☐ 8 Nm

15 - O-ring

- ☐ Replace after disassembly

16 - Exhaust turbocharger with exhaust manifold

- ☐ Removing and installing exhaust gas turbocharger
⇒ ["1.2.1 Removing and installing the exhaust gas turbocharger with exhaust manifold", page 238](#)
- ☐ Disconnect the exhaust gas turbocharger from the exhaust manifold
⇒ ["1.2.2 Removing and installing the exhaust gas turbocharger from exhaust manifold", page 243](#)

17 - Connecting hose

18 - Connecting hose

19 - Solenoid valve for charge pressure control - N75-

20 - Connecting hose

21 - Screw

- ☐ 10 Nm

22 - O-ring

- ☐ Replace after disassembly

23 - O-ring

- ☐ Replace after disassembly

24 - Screw

- ☐ 11 Nm

25 - Turbocharger divert air valve - N249-

26 - O-ring

- ☐ Replace after disassembly

27 - Inlet connection

28 - Screw

- ☐ 10 Nm

29 - Bush

30 - Circlip

- ☐ Component part of the turbocharger, not supplied separately

31 - Screw

- ☐ Component part of the turbocharger, not supplied separately
- ☐ 20 Nm

32 - Turbocharger pressure box

- ☐ Component part of the turbocharger, not supplied separately
- ☐ checking ⇒ ["1.3 Testing exhaust turbocharger pressure box", page 246](#) .
- ☐ adjust ⇒ ["1.4 Adjusting exhaust turbocharger pressure box", page 248](#)

33 - Safety nut

- ☐ Component part of the turbocharger, not supplied separately
- ☐ 10 Nm

34 - Release handle

- ☐ Component part of the turbocharger, not supplied separately

35 - Gasket

- ☐ Replace after disassembly

1.1.2 Summary of components - exhaust gas turbocharger 2

1 - Heat shield

2 - Nut

- ☐ Replace after removing
⇒ ETKA - Electronic
Catalogue of Original
Parts
- ☐ Tightening torque and
tightening order
⇒ [Fig. "Exhaust gas tur-
bocharger \(exhaust
manifold\) - tightening
torque and tightening
order"](#), page 237

3 - Support

- ☐ for heat shield

4 - Gasket

- ☐ Replace after disas-
sembly

5 - Screw

- ☐ 23 Nm

6 - Heat shield

7 - Screw

- ☐ 10 Nm

8 - Retaining plate

9 - Screw

- ☐ 10 Nm

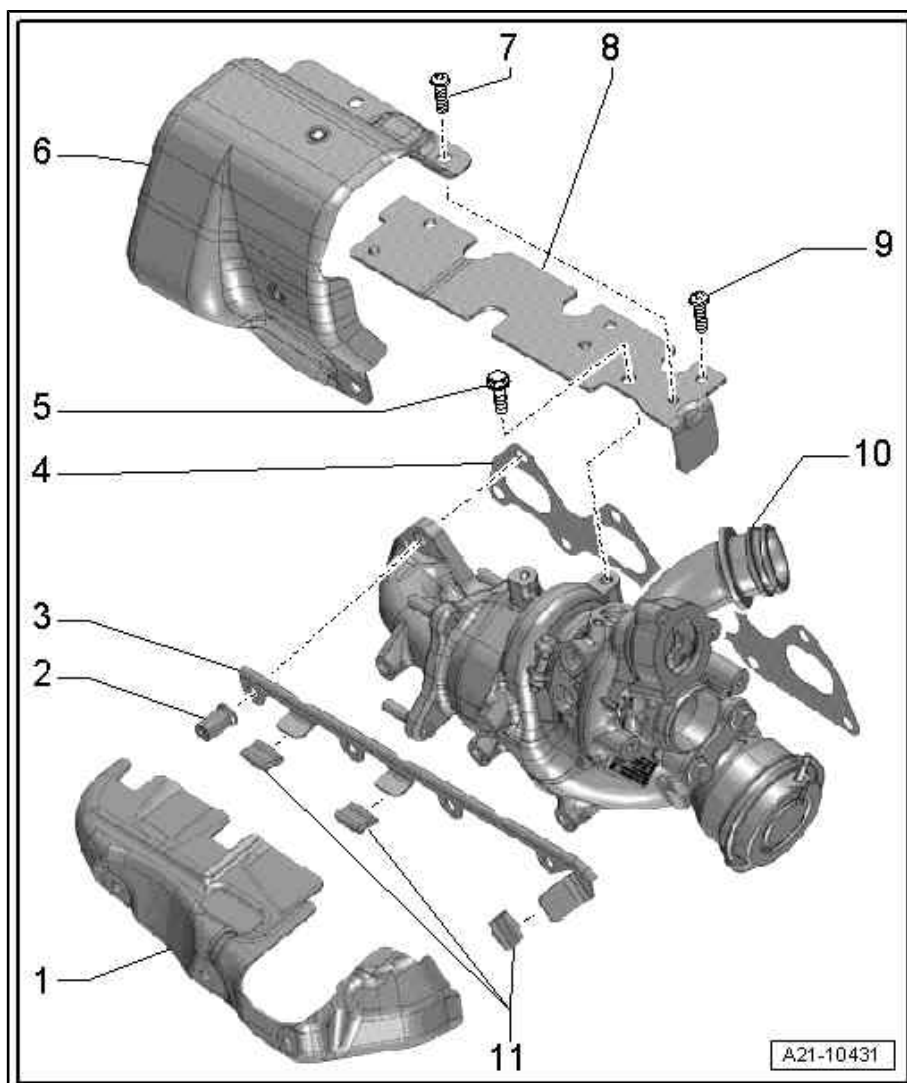
10 - Exhaust turbocharger with exhaust manifold

- ☐ Removing and installing
exhaust gas turbo-
charger
⇒ ["1.2.1 Removing and
installing the exhaust gas turbocharger with exhaust manifold"](#), page 238

- ☐ Disconnect the exhaust gas turbocharger from the exhaust manifold
⇒ ["1.2.2 Removing and installing the exhaust gas turbocharger from exhaust manifold"](#), page 243

11 - Clamps

- ☐ 3 pieces

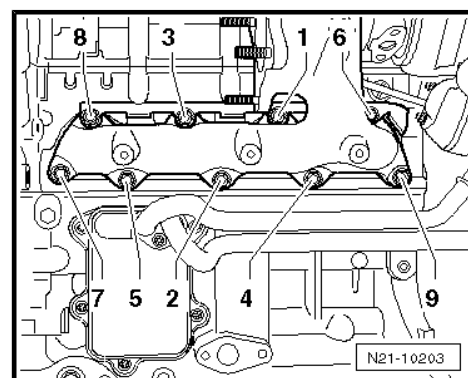


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Exhaust gas turbocharger (exhaust manifold) - tightening torque and tightening order

– Tighten the nuts in the order -1- to -9- as follows.

Stage	Nut	Specified torque
1.	-1-...-9-	Screw in hand-tight until the exhaust manifold is resting fully on the seal.
2.	-1-...-9-	16 Nm.



1.2 Removing and installing exhaust gas turbocharger

⇒ ["1.2.1 Removing and installing the exhaust gas turbocharger with exhaust manifold", page 238](#)

⇒ ["1.2.2 Removing and installing the exhaust gas turbocharger from exhaust manifold", page 243](#)

1.2.1 Removing and installing the exhaust gas turbocharger with exhaust manifold

Special tools and workshop equipment required

- ◆ Hose clamps up to 25 mm - MP 7-602 (3094)-
- ◆ Pliers for spring strap clips , e.g. -VAS 6340-
- ◆ Catch pan , e.g. -VAS 6208-
- ◆ Hot bolt paste ⇒ ETKA - Electronic Catalogue of Original Parts



Caution

In case a mechanical damage to the exhaust gas turbocharger is found, e.g. damage to the compressor wheel, it is not sufficient to only replace the turbocharger. In order to avoid consequential damage, perform the following tasks:

- ◆ *Clean all oil lines.*
- ◆ *Change engine oil and oil filter.*
- ◆ *Inspect the air filter housing, the air filter element and the intake hoses for contaminations.*
- ◆ *Inspect the whole charge-air routing and the charge air cooler for foreign bodies.*

If foreign bodies are detected in the charge air system, the complete charge-air routing must be cleaned and if necessary the charge air cooler must also be replaced.

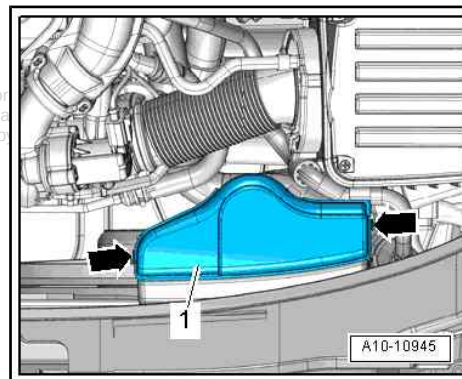
Removing

- Remove engine cover
⇒ ["3.1 Removing and installing engine trim panel", page 48](#) .

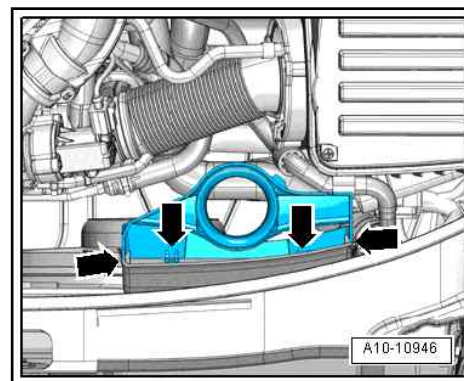
For vehicles Octavia II, Superb II, Yeti

- Remove cover -1- for connection fitting, to do so release lateral retaining clasps -arrows-.

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- Unclip inlet connections, unlock retaining clasps -arrows- to do so.

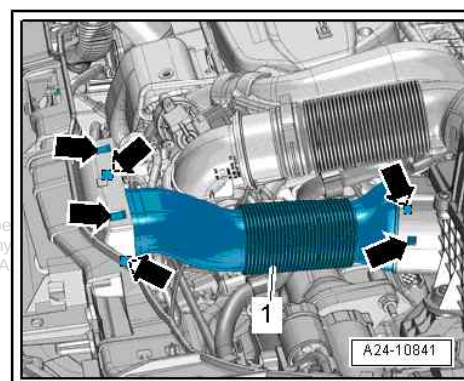
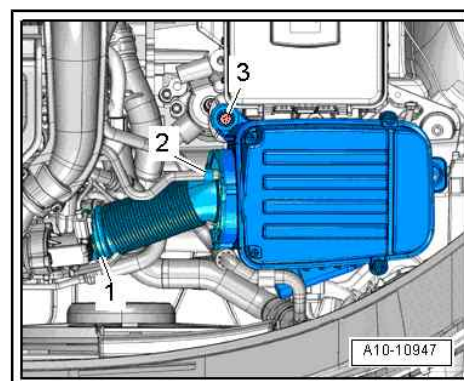


- Loosen hose clamp -1- and remove air guide hose from turbocharger.

For vehicles Rapid NH



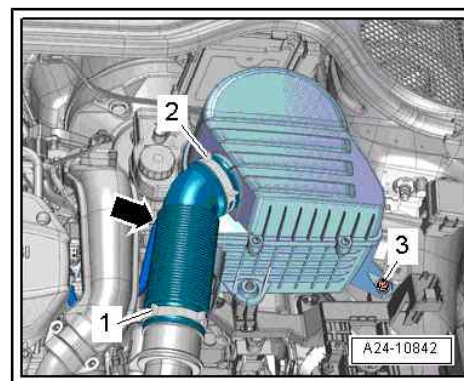
- Unlock catches -arrows- and remove air guide -1-.



- Detach the vacuum hose -arrow- from the brake servo unit.
- Loosen hose clamps -1- and -2- and remove air guide pipe.

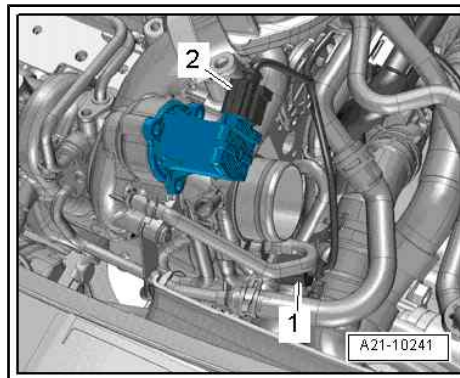
Continued for all vehicles

- Remove catalytic converter
⇒ [“2.2 Removing and installing catalytic converter”](#),
[page 311](#) .

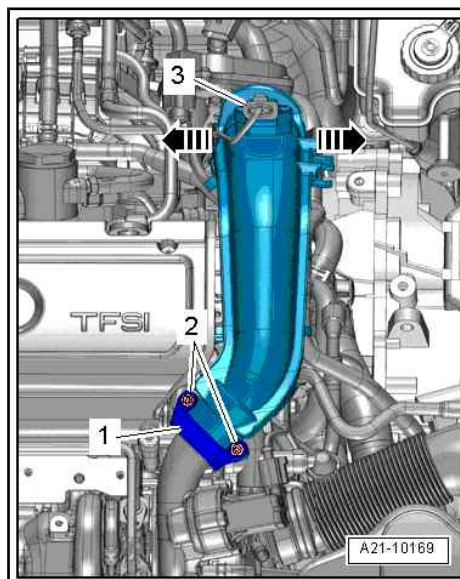




- Remove plug -1- from solenoid valve for charge pressure control - N75- and remove plug -2- from turbocharger divert air valve - N249- .

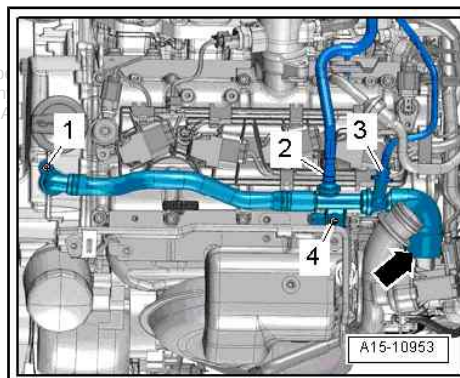


- Disconnect plug -3- at charge pressure sender - G31- with intake air temperature sender 2 - G299- .
- Unscrew fixing screws -2- and remove securing bracket -1-.
- Unhook hoses from pressure pipe and open the cable guide.
- Unlock catches -arrows- and pressure pipe first from the throttle valve control unit - J338- , then from the exhaust gas turbocharger.

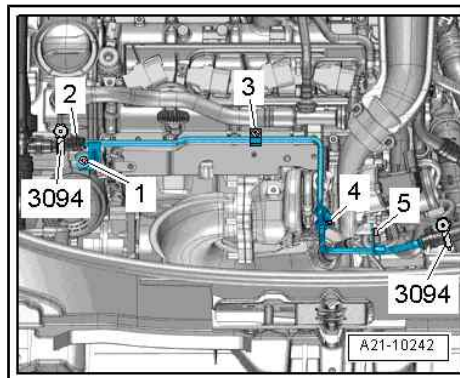


- Unscrew screws -4- and pull crankcase ventilation hose off the exhaust gas turbocharger -arrow-.

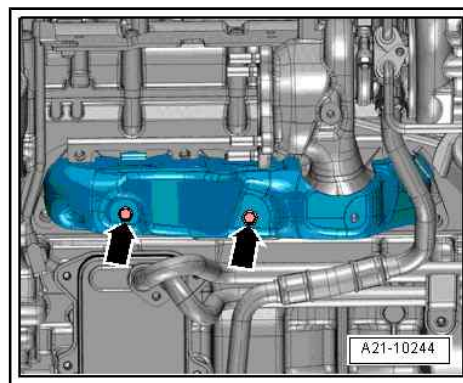
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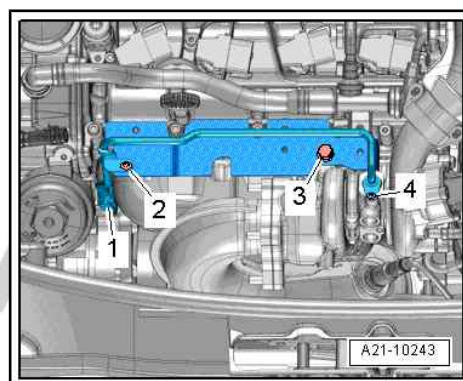
- Disconnect coolant hoses with hose clamps - MP 7-602 (3094)- as shown in the illustration.
- Place a catch pan under the engine.
- Unscrew screws -1-, -3-, -4-, -5-.
- Remove coolant lines from exhaust gas turbocharger and lay them aside.



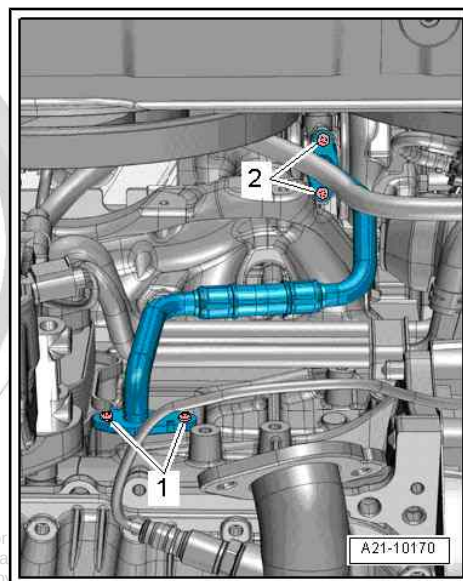
- Release fixing screws -arrows- and remove the heat shield from the exhaust manifold.



- Unscrew oil feed pipe securing bolts -2- and -4-.
- Unscrew hollow screw -1- from the timing case and remove the oil feed pipe.
- Unscrew fixing screw -3- and remove retaining plate.



- Unscrew oil return pipe fixing screws -1- and -2- and remove pipe.



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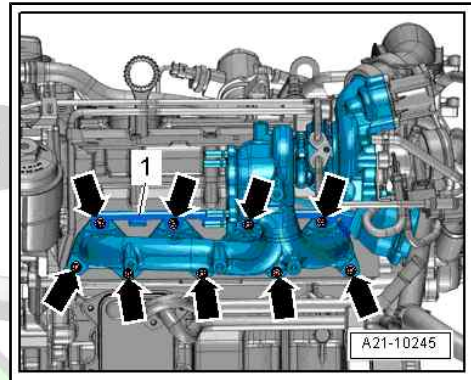


- Unscrew all exhaust manifold fixing nuts -arrows- and remove bracket -1- from the stud bolts.
- Remove exhaust manifold with exhaust turbocharger from cylinder head.



Note

If a stud bolt is unscrewed from the cylinder head during removal of the exhaust gas turbocharger, that stud bolt must be replaced ⇒ ETKA - Electronic Catalogue of Original Parts .



Install

Installation is performed in the reverse order, pay attention to the following points:



Note

- ◆ *Gaskets, sealing rings and self-locking nuts must be replaced.*
- ◆ *If a stud bolt has been unscrewed from the cylinder head during removal of the exhaust gas turbocharger, that stud bolt must be replaced ⇒ ETKA - Electronic Catalogue of Original Parts .*
- ◆ *During replacement, screw the new stud into the cylinder head until it fits on tightly (dimension 25 mm).*
- ◆ *Fixing nuts for exhaust gas turbocharger/cylinder head ⇒ ETKA - Electronic Catalogue of Original Parts .*
- ◆ *Before installing the stud bolts nuts on the cylinder head, coat them with hot bolt paste ⇒ ETKA - Electronic Catalogue of Original Parts .*
- ◆ *Fill the exhaust turbocharger with engine oil at the connection fitting for the oil feed line.*
- ◆ *After installing the turbocharger, run engine at idling speed for about 1 minute to ensure that oil is supplied to the turbocharger.*
- ◆ *Secure all hose connections with hose clamps ⇒ ETKA - Electronic Catalogue of Original Parts .*

Tightening torque for nuts of exhaust gas turbocharger and tightening sequence

⇒ [Fig. "Exhaust gas turbocharger \(exhaust manifold\) - tightening torque and tightening order", page 237](#) .

- Inspecting engine oil level:
 - ◆ ⇒ Maintenance ; Booklet Octavia II
 - ◆ ⇒ Maintenance ; Booklet Superb II
 - ◆ ⇒ Maintenance ; Booklet Yeti
 - ◆ ⇒ Maintenance ; Booklet Rapid NH
- Inspect coolant level, if necessary top up cooling system and bleed ⇒ ["1.3 Draining and filling coolant", page 155](#) .

Tightening torques

- ◆ ⇒ ["1.1 Summary of components - exhaust gas turbocharger", page 235](#)

- ◆ ➤ [“2.1 Summary of components - exhaust gas cleaning”, page 309](#)

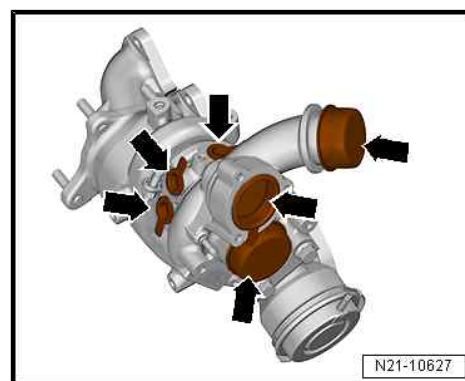
1.2.2 Removing and installing the exhaust gas turbocharger from exhaust manifold

Special tools and workshop equipment required

- ◆ Screw plug set for engine, e.g. - VAS 6122-
- ◆ Hot-air blower - V.A.G 1416-

Removing

- Exhaust turbocharger with exhaust manifold
➤ [“1.2.1 Removing and installing the exhaust gas turbocharger with exhaust manifold”, page 238](#) .
- Seal all openings on the exhaust turbocharger -arrows- with screw plugs from the screw plug set for exhaust gas turbocharger, or from the screw plug set for engine - VAS 6122- where necessary.

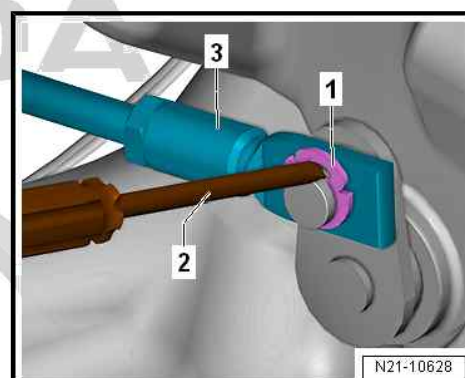


- Undo the lock washer -1- with a screwdriver -2-.
- Disconnect actuating rod -3- from the journal.

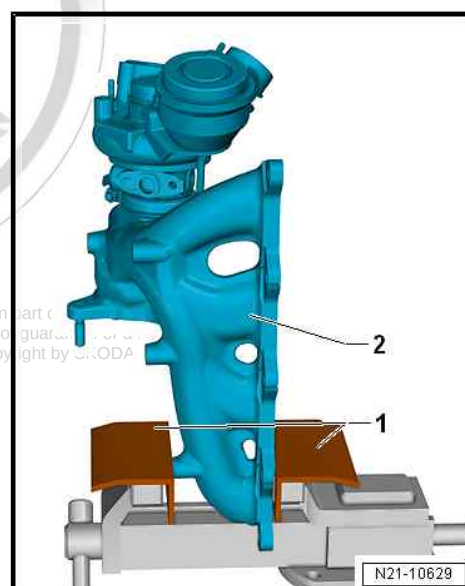


Caution

- ◆ *To prevent damage to the exhaust manifold, protective aluminium jaws -1- must be used in the vice!*



- Clamp the exhaust manifold with exhaust turbocharger -2- in the vice, as shown in the illustration.



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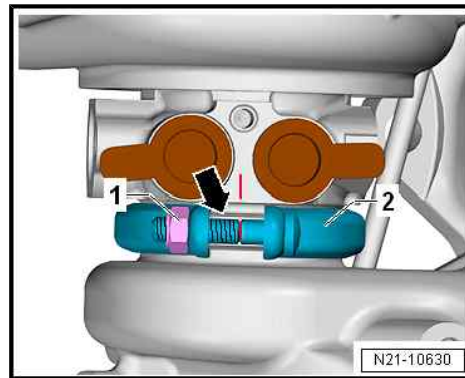
- Mark the installation position of the screw -arrow- on the exhaust gas turbocharger with a waterproof felt-tip pen.
- Unscrew the fixing nut -1- of the clamp -2- and remove the clamp.



Caution

If the exhaust manifold is still connected firmly with the exhaust turbocharger after removing clamp -2-:

- ◆ ***Do not use a lever tool to undo the connection!***
- ◆ ***Use the hot-air blower - V.A.G 1416- to loosen the connection without damaging the dowel pin on the exhaust gas turbocharger!***



If the exhaust manifold is still firmly connected with the exhaust turbocharger due to deposits:

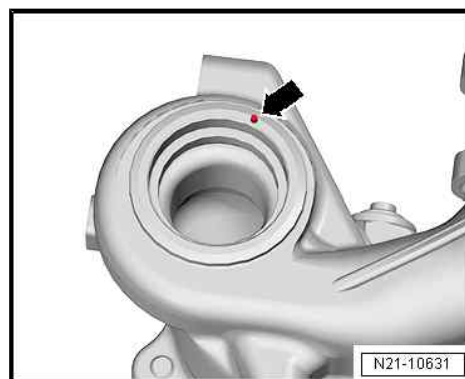
- Heat up the separation point of the exhaust manifold and turbocharger with hot-air blower - V.A.G 1416- around the circumference for approx. 2 minutes.
- Carefully remove exhaust turbocharger from the top.

If the fitted pin -arrow- is trapped or damaged, the exhaust turbocharger will need to be replaced together with the exhaust manifold.



Caution

- ◆ ***Place the exhaust turbocharger down onto the work bench as shown so as to prevent damage to the turbine wheel!***
- ◆ ***Do not use any compressed air for cleaning the exhaust turbocharger.***



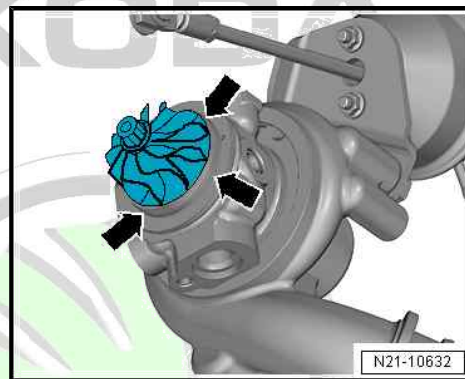
- Clean the exhaust turbocharger all the way around -arrows- e. g. with brake cleaner and abrasive paper (grain 220 ... 1000).
- Remove the exhaust manifold from the vice.

Install

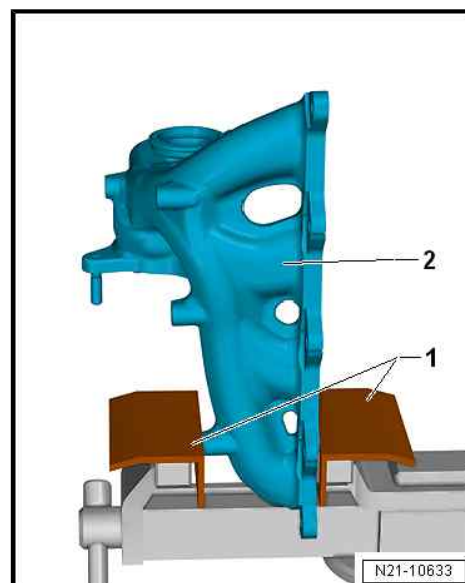


Caution

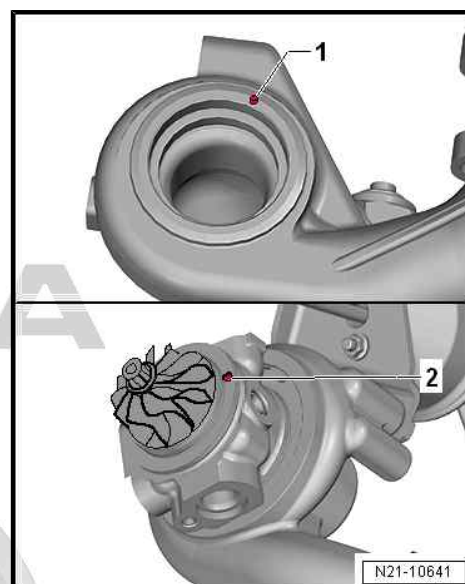
- ◆ ***To prevent damage to the exhaust manifold, protective aluminium jaws -1- must be used in the vice!***



- Clamp new exhaust manifold -2- in the vice, as shown in the illustration.
- Carefully mount the exhaust turbocharger to the exhaust manifold.

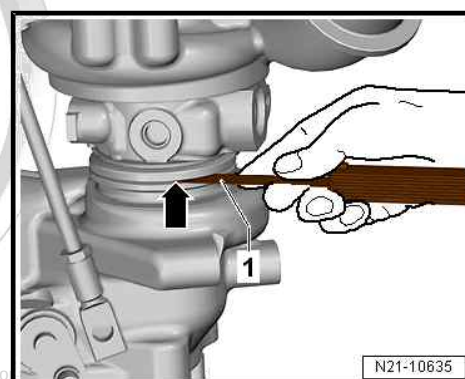


- The fitted pin -1- of the exhaust manifold must lock into place into the bore -2- of the exhaust turbocharger.
- Using a feeler gauge -1- check the gap size -arrow- between the exhaust manifold and exhaust turbocharger.



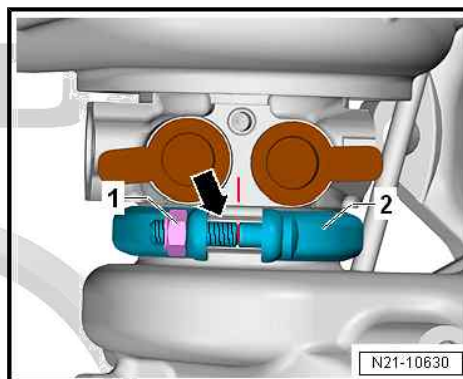
Gap size must be around ≤ 1.2 mm.

- Attach a new clamp around the two flanges.

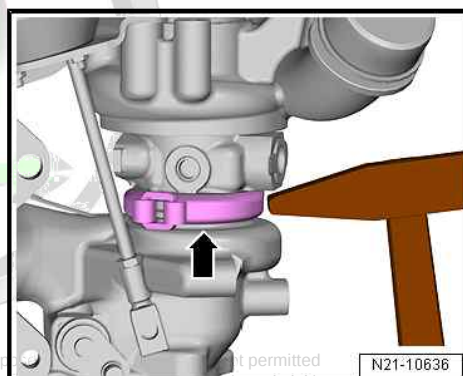


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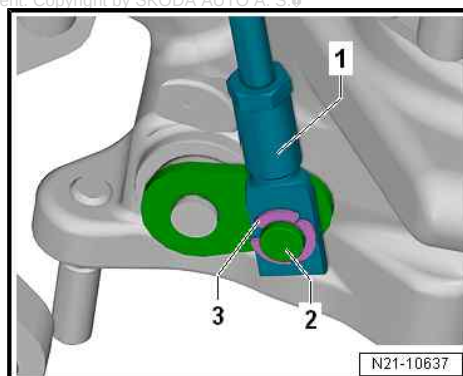
- Align the clamp in such a way that the middle of the threaded bolt is positioned above the mark -arrow- on the exhaust turbocharger.
- Tighten the fixing nut -1- of the clamp -2- to 10 Nm.



- Using a hammer, lightly tap all around the clamp -arrow- to ensure that the clip is seated correctly.
- Tighten securing nut to 10 Nm again.



- Push actuating rod -1- of the pressure box to the journal -2-.
- Slide the new lock washer -3- into the groove on the journal.
- Testing the setting on the pressure box for exhaust gas turbocharger
⇒ ["1.3 Testing exhaust turbocharger pressure box", page 246](#).
- Installing the exhaust turbocharger with exhaust manifold
⇒ ["1.2.1 Removing and installing the exhaust gas turbocharger with exhaust manifold", page 238](#).



1.3 Testing exhaust turbocharger pressure box

Special tools and workshop equipment required

- ◆ Hand vacuum pump , e.g. -VAS 6213-

Test requirements

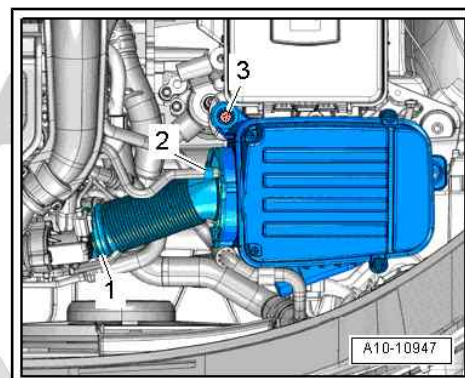
- The hose from the exhaust gas turbocharger via the charge pressure control solenoid valve - N75- to the pressure box must have continuity and must be tight.
- The solenoid valve for charge pressure control - N75- is OK.

Work procedure

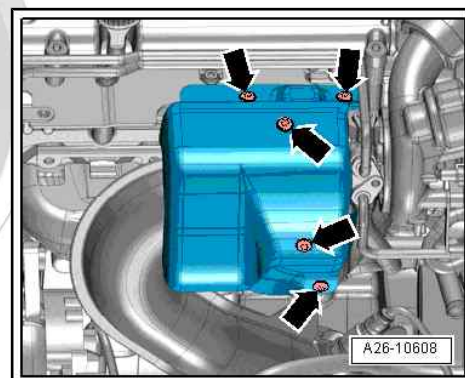
- Loosen hose clamp -1- and remove air guide hose from turbocharger.

Note

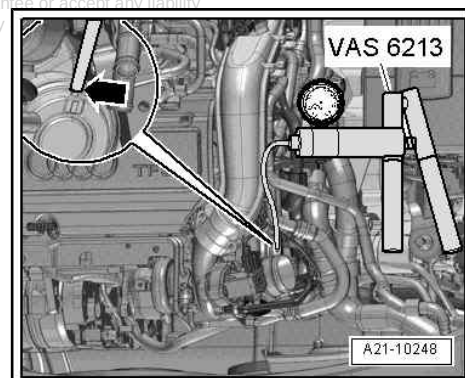
Ignore positions -2- and -3-.



- Unscrew screws -arrows- and remove exhaust gas turbocharger heat shield.



- Remove vacuum hose -arrow- from the exhaust gas turbocharger pressure box and connect hand vacuum pump - VAS 6213- in its place.



- Put the sliding ring -1- of the hand vacuum pump - VAS 6213- in position -B- for "pressure".
- Operate hand vacuum pump - VAS 6213- several times.

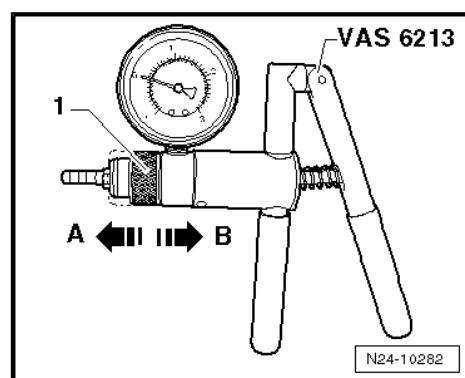


Caution

Risk of damage to the pressure box from excessive pressure.
The pressure must not be greater than 0.08 MPa (800 mbar).

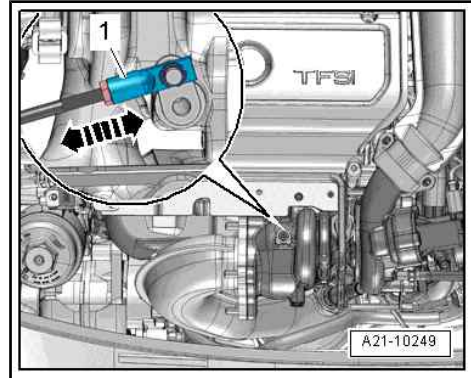
Note

The installation position can be seen in the illustration with the exhaust gas turbocharger removed.





- Observe the actuating rod -1- of the exhaust gas turbocharger pressure box.
- The actuating rod must move at approx. 0.03 MPa (300 mbar).
- The actuating rod must be at the end of the adjustment path at approx. 0.08 MPa (800 mbar).



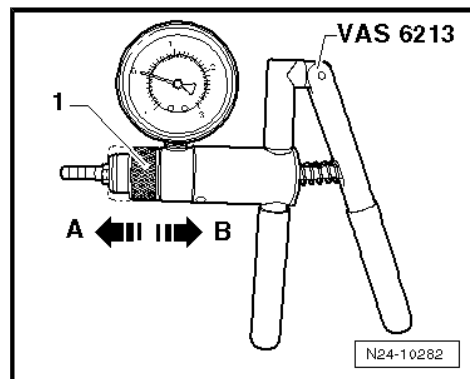
- Ventilate the hand vacuum pump - VAS 6213- -arrow A-.
- The actuating rod must move in the reverse direction.



Note

Observe the motion sequence of the actuating rod over the entire adjustment range. It must move continuously and without jolting.

If the actuating rod of the pressure box for the exhaust turbocharger is jammed or does not move:



- By hand, check the actuating rod -1- for ease of motion over the entire adjustment area.



Note

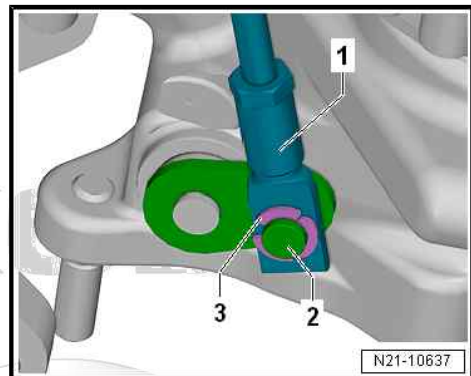
Ignore positions -2- and -3-.

If the actuating rod of the pressure box moves evenly in the entire area without a significant resistance, this means the pressure box is faulty.

- Replacing the exhaust turbocharger with exhaust manifold
⇒ [“1.2.1 Removing and installing the exhaust gas turbocharger with exhaust manifold”, page 238](#) .

If the actuating rod of the pressure box does not move evenly in the entire range, is jammed, or is corroded and cannot be made to move by lubrication:

- Replacing the exhaust manifold
⇒ [“1.2.2 Removing and installing the exhaust gas turbocharger from exhaust manifold”, page 243](#) .



Tightening torques

- ♦ ⇒ [“1.1.2 Summary of components - exhaust gas turbocharger 2”, page 237](#)

1.4 Adjusting exhaust turbocharger pressure box

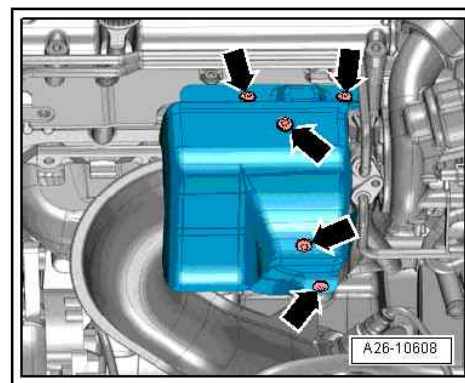
Special tools and workshop equipment required

- ♦ Universal dial gauge bracket , e.g. -MP 3-447 (VW 387)-
- ♦ Hand vacuum pump , e.g. -VAS 6213-
- ♦ Pressure control valve , e.g. -VAS 6342-

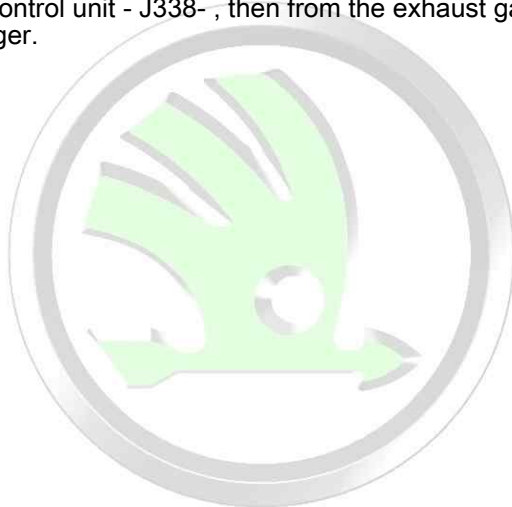
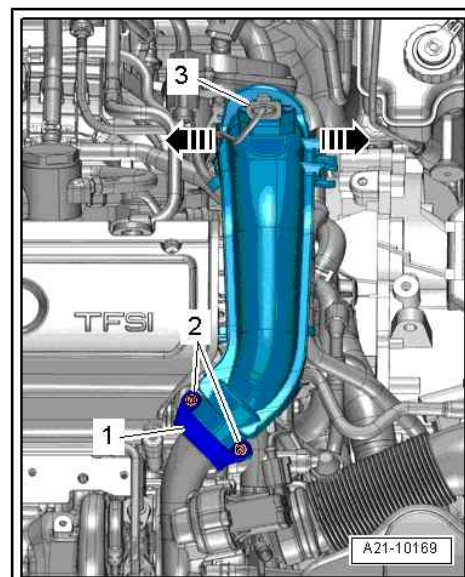
- ◆ Turbocharger tester , e.g. -V.A.G 1397A-
- ◆ Dial gauge , e.g. -VAS 6341/1-
- ◆ Flat button , e.g. -VAS 6341/4-
- ◆ Hose clamps up to 25 mm - MP 7-602 (3094)-
- ◆ Pliers for spring strap clips , e.g. -VAS 6340-
- ◆ Catch pan , e.g. -VAS 6208-

Work procedure

- Remove engine cover
⇒ ["3.1 Removing and installing engine trim panel", page 48](#) .
- Remove air filter housing:
- ◆ Octavia II, Superb II and Yeti
⇒ ["3.2.1 Removing and installing air filter housing \(Octavia II, Superb II, Yeti\)", page 277](#) .
- ◆ Rapid NH
⇒ ["3.2.2 Removing and installing the air filter housing \(Rapid NH\)", page 278](#) .
- Unscrew screws -arrows- and remove exhaust gas turbocharger heat shield.

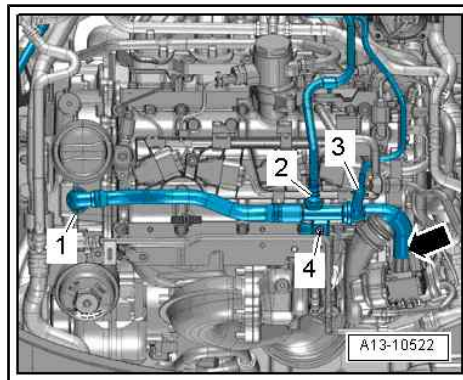


- Unscrew screws -2- and remove retaining bracket -1-.
- Disconnect plug -3- at charge pressure sender - G31- with intake air temperature sender 2 - G299- .
- Unhook hoses from pressure pipe and open the cable guide.
- Unlock catches -arrows- and pressure pipe first from the throttle valve control unit - J338- , then from the exhaust gas turbocharger.

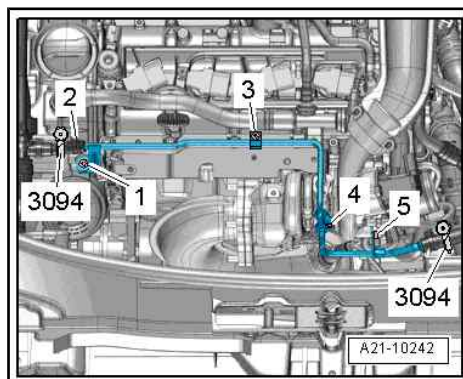




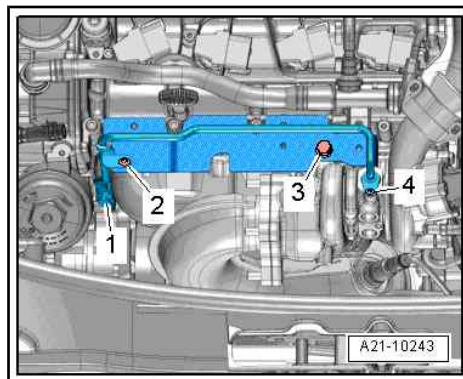
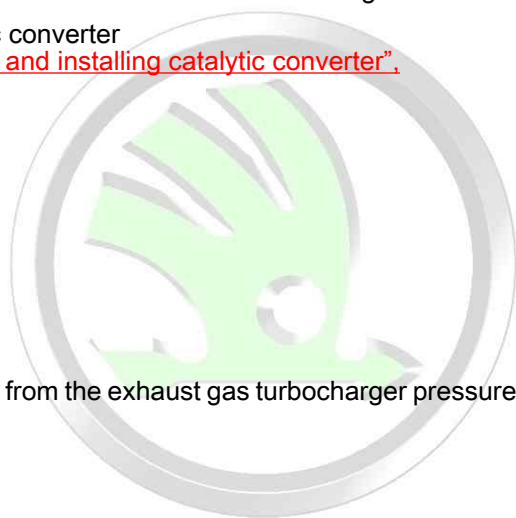
- Unscrew screw -4- and remove crankcase ventilation hose from exhaust gas turbocharger -arrow- and lay it aside.



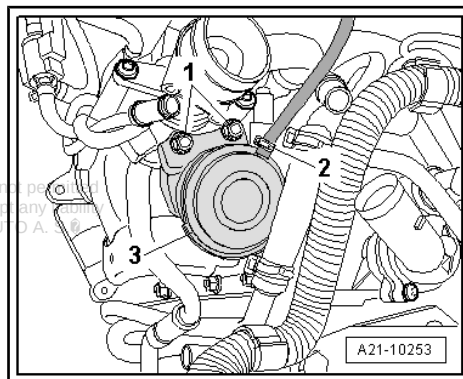
- Disconnect coolant hoses with hose clamps - MP 7-602 (3094)- as shown in the illustration.
- Unscrew screws -1-, -3-, -4-, -5-.
- Place a catch pan under the engine.
- Remove coolant lines from exhaust gas turbocharger and lay them aside.



- Release screws -2- and -3- and remove retaining bracket.
- Remove catalytic converter
⇒ [“2.2 Removing and installing catalytic converter”, page 311](#).

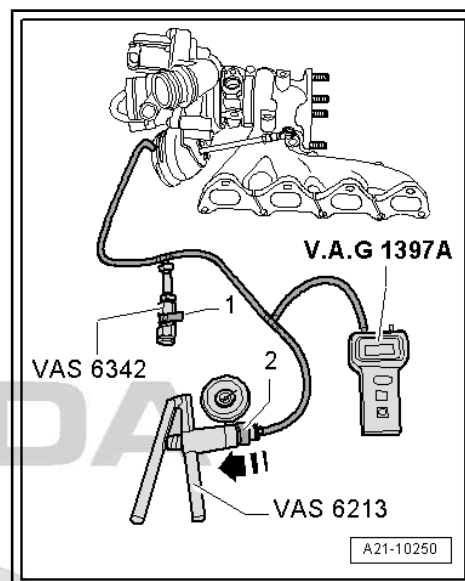


- Remove hose -2- from the exhaust gas turbocharger pressure box.



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- Fit measurement and testing devices together as shown in the illustration and connect to connection “II” of the turbocharger testing device - V.A.G 1397A- as well as to the exhaust gas turbocharger pressure box.
- Close lever -1- on pressure control valve - VAS 6342- .
- Put the sliding ring -2- of the hand vacuum pump - VAS 6213- in -direction of the arrow-.

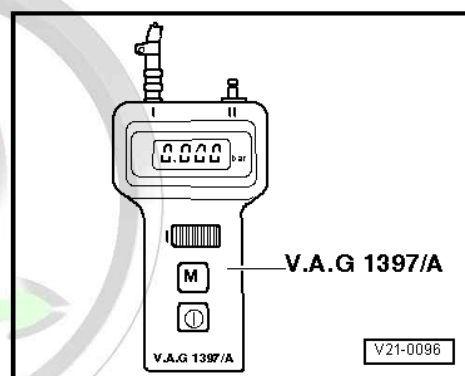


- Switch on turbocharger tester - V.A.G 1397A- and switch slide switch to position “II”.
- Actuate hand vacuum pump - VAS 6213- until a pressure of approximately 0.08 MPa (800 mbar) is reached.

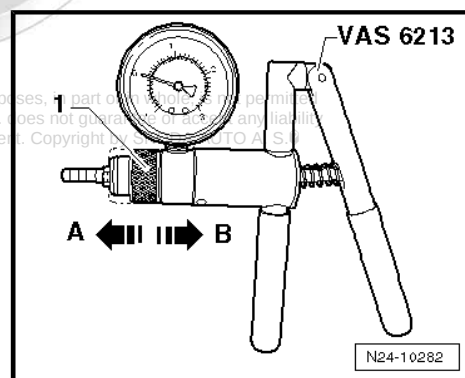


Caution

*Risk of damage to the pressure box from excessive pressure.
The pressure must not be greater than 0.08 MPa (800 mbar).*

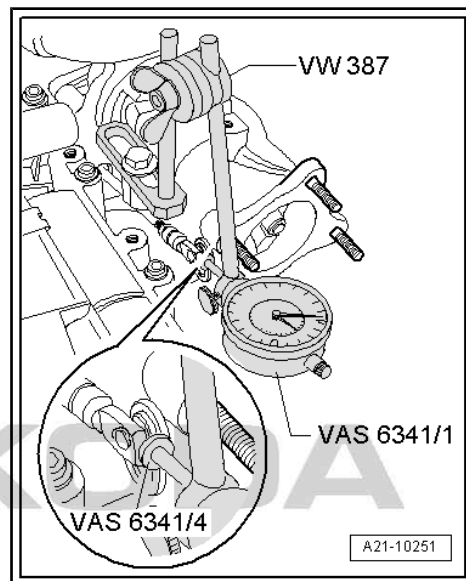


- Ventilate the hand vacuum pump - VAS 6213- -arrow A- so that the actuating rod of the charge pressure controller moves freely in the exhaust gas turbocharger.
- Repeat process 5 times.





- Secure universal dial gauge bracket - VW 387- to the exhaust gas turbocharger, as shown in the illustration.
- Secure dial gauge - VAS 6341/1- with flat button - VAS 6341/4- to universal dial gauge bracket - VW 387- .
- Pre-tension dial gauge - VAS 6341/1- at 0 MPa (0 bar) to 1 mm.
- Set dial gauge - VAS 6341/1- display to "0".
- Operate the hand vacuum pump - VAS 6213- several times until the turbocharger tester - V.A.G 1397A- indicates a pressure of 0.043 MPa (430 mbar).
- Specified value on dial gauge - VAS 6341/1- : 1 mm stroke.

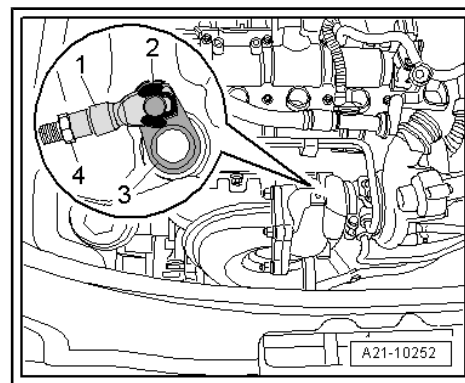


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Note

- ◆ If the specified value is not reached, loosen the counter nut -4-.
- ◆ Lever off lock washer -2- and pull threaded piece -1- off the operating lever bolt -3-.
- ◆ Turn threaded piece on the actuating rod until the specified value is reached. To check threaded pieces, place them on the actuating lever bolts.
- ◆ Secure threaded piece to the actuating lever bolt using lock washer -2- and tighten counter nut -4-.



Setting the pressure box timing

- Pre-tension dial gauge - VAS 6341/1- at 0 MPa (0 bar) to 1 mm.

Measurement 1:

- Operate the hand vacuum pump - VAS 6213- several times until the turbocharger tester - V.A.G 1397A- indicates a pressure of 0.075 to 0.080 MPa (750 to 800 mbar).
- Reduce pressure on pressure control valve - VAS 6342- to 0.042 MPa (420 mbar).
- Read stroke on dial gauge - VAS 6341/1- and make a note of it.
- Reduce pressure on pressure control valve - VAS 6342- to 0 MPa (0 bar).
- Operate the hand vacuum pump - VAS 6213- several times until the turbocharger tester - V.A.G 1397A- indicates a pressure of 0.042 MPa (420 mbar).
- Read stroke on dial gauge - VAS 6341/1- and make a note of it.
- Calculate mean value, add values "1" and "2" together and divide by 2.
- Specified value: 1 mm

Measurement 2:

- Operate the hand vacuum pump - VAS 6213- several times until the turbocharger tester - V.A.G 1397A- indicates a pressure of 0.075 to 0.080 MPa (750 to 800 mbar).
- Reduce pressure on pressure control valve - VAS 6342- to 0.052 MPa (520 mbar).
- Read stroke on dial gauge - VAS 6341/1- and make a note of it.
- Reduce pressure on pressure control valve - VAS 6342- to 0 MPa (0 bar).
- Set dial gauge - VAS 6341/1- display to "0".
- Operate the hand vacuum pump - VAS 6213- several times until the turbocharger tester - V.A.G 1397A- indicates a pressure of 0.052 MPa (520 mbar).
- Read stroke on dial gauge - VAS 6341/1- and make a note of it.
- Calculate mean value, add values "1" and "2" together and divide by 2.



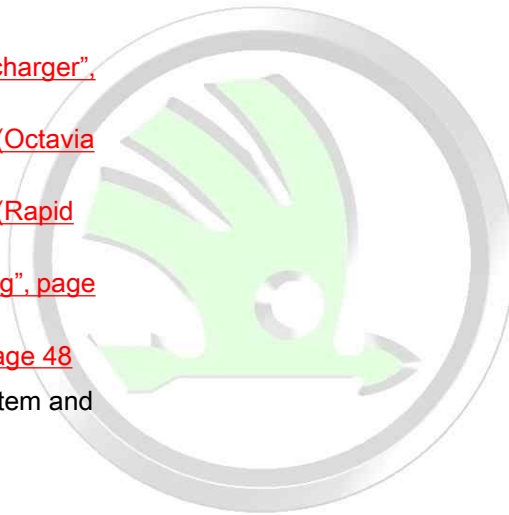
- Specified value: 5 mm
- If the specified values are not reached, repeat setting.

Installation is carried out in reverse order of removal. When installing, note the following:

Tightening torques

- ◆ ⇒ [“1.1 Summary of components - exhaust gas turbocharger”, page 235](#)
- ◆ ⇒ [“3.1.1 Summary of components - air filter housing \(Octavia II, Superb II and Yeti\)”, page 276](#)
- ◆ ⇒ [“3.1.2 Summary of components - air filter housing \(Rapid NH\)”, page 277](#)
- ◆ ⇒ [“2.1 Summary of components - exhaust gas cleaning”, page 309](#)
- ◆ ⇒ [“3.1 Removing and installing engine trim panel”, page 48](#)
- Inspect coolant level, if necessary top up cooling system and bleed ⇒ [“1.3 Draining and filling coolant”, page 155](#) .

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2 Charge air system with exhaust gas turbocharger

⇒ [“2.1 Summary of components - charge air system”, page 255](#)

⇒ [“2.2 Summary of components - hose connections of the charge air system”, page 260](#)

⇒ [“2.3 Checking the charge-air system for leaktightness”, page 261](#)

2.1 Summary of components - charge air system

⇒ [“2.1.1 Summary of components - charge air system \(Octavia II, Superb II and Yeti\)”, page 255](#)

⇒ [“2.1.2 Summary of components - charge air system \(Rapid NH\)”, page 257](#)

2.1.1 Summary of components - charge air system (Octavia II, Superb II and Yeti)



Note

Two charge air coolers are used for this engine. One charge air cooler is located in the intake manifold and cooled by coolant ⇒ [“1.1.1 Connection diagram - coolant hoses \(Octavia II, Superb II and Yeti\)”, page 150](#) . The second charge air cooler is located, as in the past, in the lock carrier and is air-cooled.

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1 - Charge air cooling circuit radiator

- ☐ with top and bottom sealing strips
- ☐ removing and installing
⇒ [“3.3 Removing and installing charge air cooling circuit radiator \(Octavia II, Superb II, Yeti\)”](#), page 172

2 - O-ring

- ☐ replace if damaged

3 - Top coolant hose

- ☐ connection diagram for coolant hoses
⇒ [“1.1.1 Connection diagram - coolant hoses \(Octavia II, Superb II and Yeti\)”](#), page 150

4 - Spring strap clamp

- ☐ removing and installing with pliers for spring strap clips, e.g. -VAS 6340-

5 - Connecting pipe

6 - Coolant hose

- ☐ to the expansion reservoir
- ☐ connection diagram for coolant hoses
⇒ [“1.1.1 Connection diagram - coolant hoses \(Octavia II, Superb II and Yeti\)”](#), page 150

7 - Sealing grommet

8 - Coolant hose

- ☐ to exhaust gas turbocharger
- ☐ connection diagram for coolant hoses
⇒ [“1.1.1 Connection diagram - coolant hoses \(Octavia II, Superb II and Yeti\)”](#), page 150

9 - Coolant hose

- ☐ connection diagram for coolant hoses
⇒ [“1.1.1 Connection diagram - coolant hoses \(Octavia II, Superb II and Yeti\)”](#), page 150

10 - Intake manifold

- ☐ removing and installing ⇒ [“4.2 Removing and installing intake manifold”](#), page 281

11 - Gasket

- ☐ replace if damaged

12 - Seal

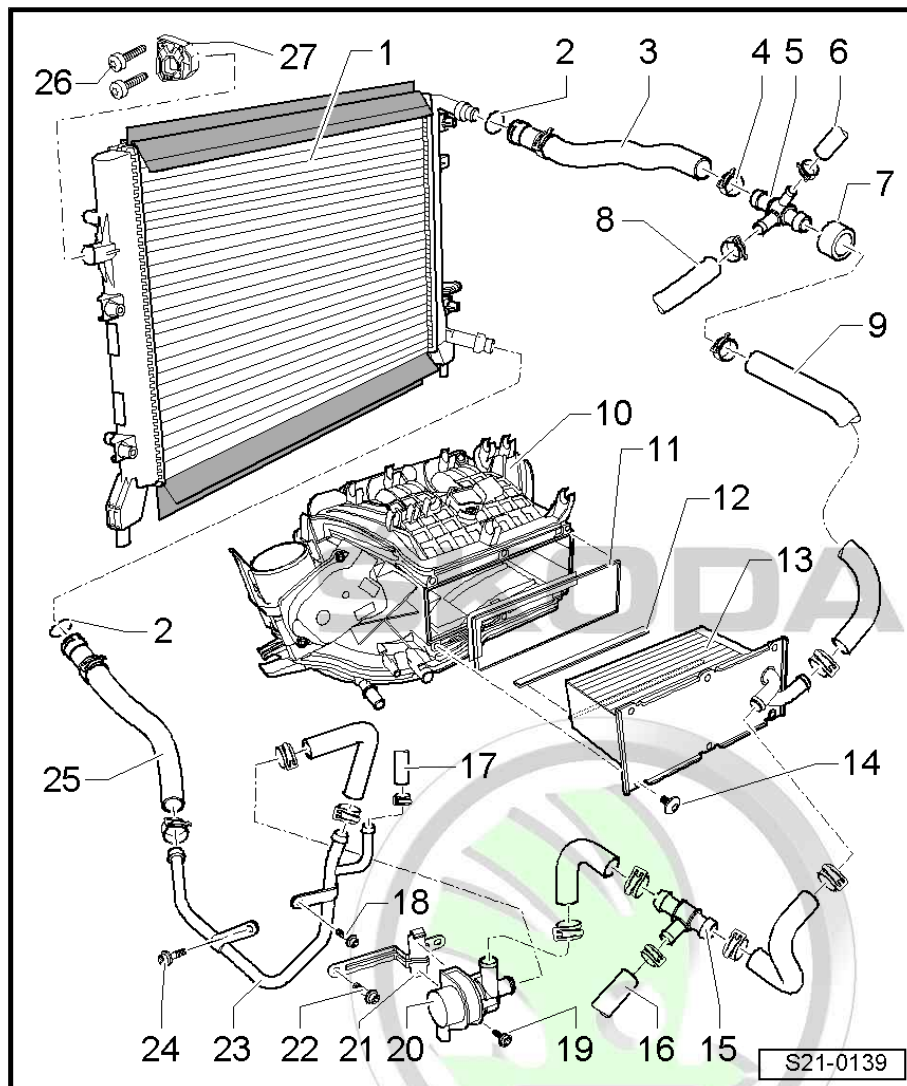
- ☐ pay attention to correct position

13 - Charge air cooler

- ☐ in the intake manifold
- ☐ to remove take off intake manifold ⇒ [“4.2 Removing and installing intake manifold”](#), page 281

14 - Screw

- ☐ During installation, first tighten until hand-tight, then tighten to the tightening torque



- ☐ 9 Nm

15 - Connecting pipe

16 - Coolant hose

- ☐ connection diagram for coolant hoses
⇒ [“1.1.1 Connection diagram - coolant hoses \(Octavia II, Superb II and Yeti\)”, page 150](#)

17 - Coolant hose

- ☐ connection diagram for coolant hoses
⇒ [“1.1.1 Connection diagram - coolant hoses \(Octavia II, Superb II and Yeti\)”, page 150](#)

18 - Screw

- ☐ 8 Nm

19 - Screw

- ☐ Tightening torque ⇒ [“2.1 Assembly overview - coolant pump”, page 160](#)

20 - Coolant recirculation pump - V50-

- ☐ removing and installing ⇒ [“2.3.1 Removing and installing coolant recirculation pump V50 ”, page 162](#)
- ☐ Summary of components ⇒ [“2.1 Assembly overview - coolant pump”, page 160](#)

21 - Support

22 - Screw

- ☐ Tightening torque ⇒ [“2.1 Assembly overview - coolant pump”, page 160](#)

23 - Coolant pipe

- ☐ connection diagram for coolant hoses
⇒ [“1.1.1 Connection diagram - coolant hoses \(Octavia II, Superb II and Yeti\)”, page 150](#)

24 - Screw

- ☐ 8 Nm

25 - Bottom coolant hose

- ☐ connection diagram for coolant hoses
⇒ [“1.1.1 Connection diagram - coolant hoses \(Octavia II, Superb II and Yeti\)”, page 150](#)

26 - Screw

- ☐ 7 Nm

27 - Bearings

- ☐ Charge air cooling circuit radiator
- ☐ check fitting position: Opening for connection piece must be at the top

2.1.2 Summary of components - charge air system (Rapid NH)



Note

- ◆ *The radiator and the additional radiator for the coolant of the charge air cooling system are separate parts.*
- ◆ *The radiator is placed on the additional radiator for coolant of the charge air cooling system.*
- ◆ *The coolant radiator and the charge air cooler are removed and installed together.*



1 - Radiator

- ☐ removing and installing
⇒ ["3.2 Removing and installing radiator", page 169](#)

2 - Intake manifold

- ☐ removing and installing
⇒ ["4.2 Removing and installing intake manifold", page 281](#)

3 - Seal

- ☐ pay attention to correct position

4 - Gasket

- ☐ replace if damaged

5 - Charge air cooler

- ☐ in the intake manifold
- ☐ to remove take off intake manifold
⇒ ["4.2 Removing and installing intake manifold", page 281](#)

6 - Coolant hose

- ☐ to exhaust gas turbo-charger
- ☐ connection diagram for coolant hoses
⇒ ["1.1.2 Connection diagram - coolant hoses \(Rapid NH\)", page 152](#)

7 - Screw

- ☐ when installing first tighten evenly by hand, then tighten crosswise from the inside to the outside to the recommended tightening torque

- ☐ 9 Nm
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8 - Coolant hose

- ☐ to the expansion reservoir
- ☐ connection diagram for coolant hoses
⇒ ["1.1.2 Connection diagram - coolant hoses \(Rapid NH\)", page 152](#)

9 - Hose clamp

- ☐ attached to the timing case

10 - Coolant hose

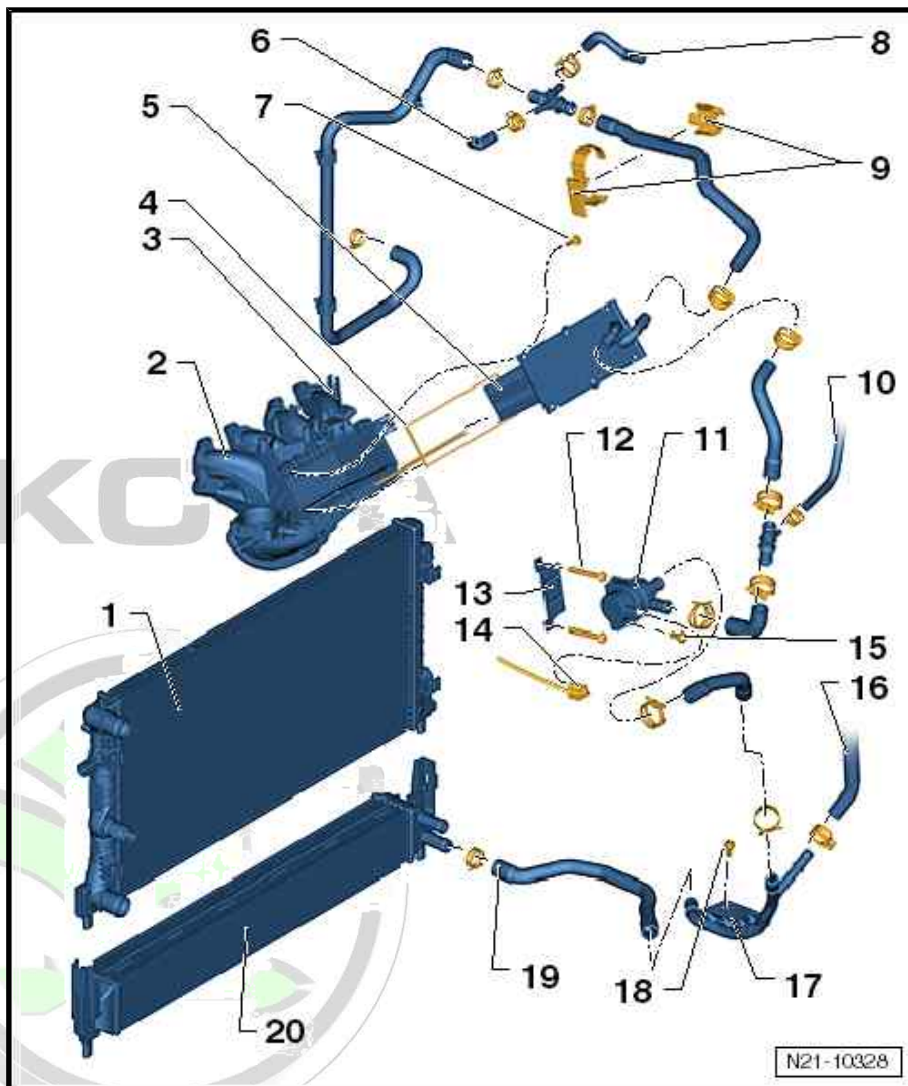
- ☐ to exhaust gas turbocharger
- ☐ connection diagram for coolant hoses
⇒ ["1.1.2 Connection diagram - coolant hoses \(Rapid NH\)", page 152](#)

11 - Coolant recirculation pump - V50-

- ☐ removing and installing ⇒ ["2.3.1 Removing and installing coolant recirculation pump V50", page 162](#)
- ☐ Summary of components ⇒ ["2.1 Assembly overview - coolant pump", page 160](#)

12 - Screw

- ☐ Tightening torque ⇒ ["2.1 Assembly overview - coolant pump", page 160](#)



13 - Support

14 - Connector

15 - Screw

- ☐ Tightening torque ⇒ [“2.1 Assembly overview - coolant pump”, page 160](#)

16 - Coolant hose

- ☐ to engine oil cooler
- ☐ connection diagram for coolant hoses
⇒ [“1.1.2 Connection diagram - coolant hoses \(Rapid NH\)”, page 152](#)

17 - Coolant pipe

- ☐ attached to the oil pan
- ☐ connection diagram for coolant hoses
⇒ [“1.1.2 Connection diagram - coolant hoses \(Rapid NH\)”, page 152](#)

18 - Screw

- ☐ 8 Nm

19 - Bottom coolant hose

- ☐ connection diagram for coolant hoses
⇒ [“1.1.2 Connection diagram - coolant hoses \(Rapid NH\)”, page 152](#)

20 - Charge air cooler

- ☐ removing and installing ⇒ [“3.2 Removing and installing radiator”, page 169](#)

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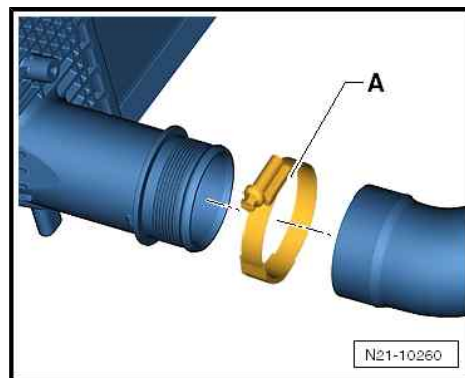
2.2 Summary of components - hose connections of the charge air system

Hose connections with fluted pipes



Caution

The screw clamps -A- on the charge air hoses must be tightened to 6 Nm. A too low, but also a too high tightening torque, may result in the hose slipping off the charge air pipe during driving.



Note

- ◆ Before an inspection or a repair, check all the air guide pipes and air guide hoses as well as vacuum lines for tight connection and leaktightness.
- ◆ The pipe support and the air guide hoses must be de-oiled and degreased before installing.
- ◆ Secure all hose connections with hose clamps which comply with the series design ➔ ETKA - Electronic Catalogue of Original Parts .
- ◆ In order to secure the air guide hoses on their connection fittings, the screw threads must be sprayed with rust solvent before installing if the screw clamps have been used beforehand.

Hose connections with quick couplings



Caution

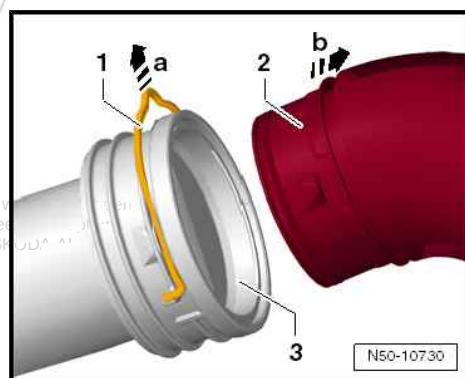
The gasket ring for the quick coupling can be damaged, if the securing clamp is in the lock position during the assembly. This could result in a leakage. Observe the assembly instruction.

Removing

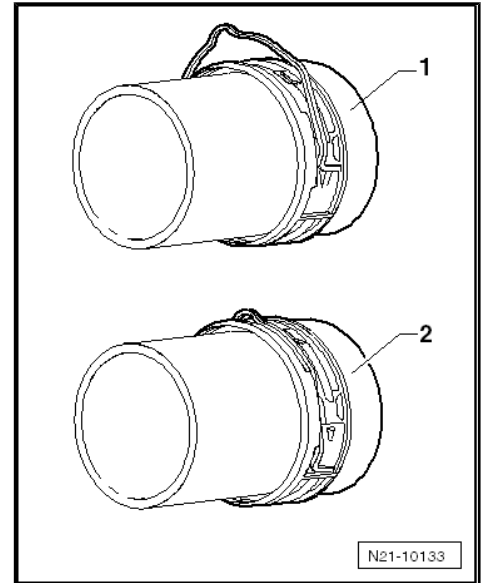
- Release the securing clamp -1- in the -direction of arrow a- by pulling on it.
- Pull hose -2- in -direction of arrow b- out of the quick coupling -3- without using a tool.

Install

- When replacing the gasket ring, place the gasket ring in the groove of the charge air hose. Make sure that the gasket ring is placed all around in the groove and is not twisted.
- Oil sealing surface and gasket ring.



- Put the securing clamp into the release position -1-.
- Insert the charge air hose up to the stop into the coupling.
- Move the locking clip to “locked” position -2- and then press the charge air hose back on again.
- Check hose for tight connection by pulling on it and check the correct locking of the quick coupling.



2.3 Checking the charge-air system for leaktightness

Special tools and workshop equipment required

- ◆ Tester for charge-air systems - V.A.G 1687- with adapters - V.A.G 1687/10- and -V.A.G 1687/14-
- ◆ Pliers for spring strap clips , e.g. -VAS 6340-

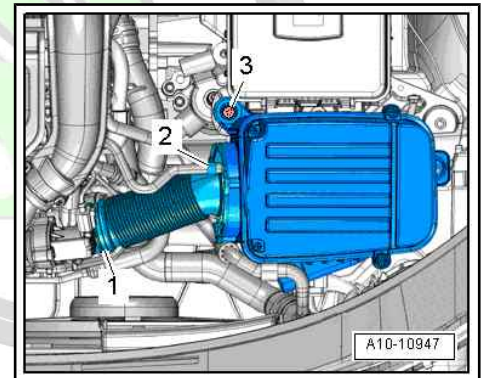
Work procedure

- Remove engine cover
⇒ [“3.1 Removing and installing engine trim panel”, page 48](#) .

For vehicles Octavia II, Superb II, Yeti

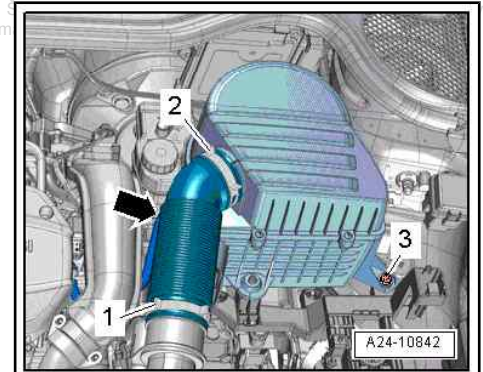
- Loosen hose clamp -1- and remove air guide hose from turbocharger.

For vehicles Rapid NH



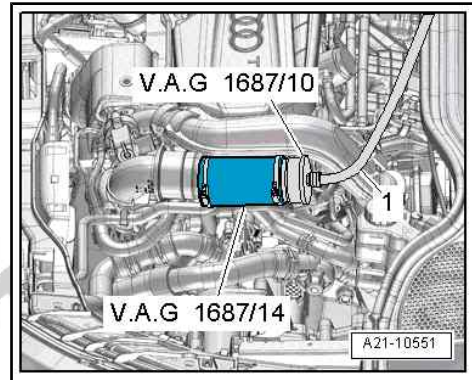
- Detach the vacuum hose -arrow- from the brake servo unit.
- Loosen hose clamps -1- and -2- and remove air guide pipe.

Continued for all vehicles



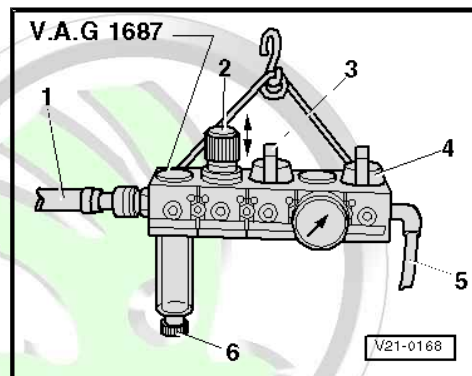


- Connect adapter - V.A.G 1687/14- with adapter - V.A.G 1687/10- at inlet connection of exhaust gas turbocharger.
- Connect hose -1- of charge air system tester to adapter - V.A.G 1687/10- .



Prepare tester for charge air system - V.A.G 1687- as follows:

- Unscrew pressure control valve -2- fully and close the valves -3- and -4-.
- The rotary knob must be pulled to the top in order to rotate the pressure control valve -2-.
- Connect tester for charged-air systems - V.A.G 1687- to pressure air guide using a commercially available intermediate piece -1-.



Note

If there is water in the inspection glass, drain water via the drain plug -6-.

- Open valve -3-.



Caution

Risk of damage owing to pressure being set too high.

- ◆ ***The pressure must not be greater than 0.5 bar!***

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- Set the pressure to 0.5 bar with the pressure control valve -2-.
- Open valve -4- and wait until the test circuit is full. If necessary readjust pressure to 0.5 bar.
- Listen to, touch or use commercially available leak search spray or the ultrasonic measuring device - V.A.G 1842- to check the charge-air system for leak points.



Note

- ◆ *A small amount of air escapes via the valves into the engine. For this reason no holding pressure test is possible.*
- ◆ *Use of ultrasonic measuring device -V.A.G 1842- ⇒ Operating instructions .*
- ◆ *Before removing the adapter, depressurize the test circuit by detaching the hose coupling.*

Tightening torques

- ◆ ⇒ [“3.1 Removing and installing engine trim panel”, page 48](#)

24 – Mixture preparation - injection

1 Injection system

⇒ [“1.1 Installation location overview - fuel injection system”, page 263](#)

⇒ [“1.2 Reduce fuel pressure”, page 269](#)

1.1 Installation location overview - fuel injection system

⇒ [“1.1.1 Installation location overview - engine compartment right \(Octavia II, Superb II and Yeti\)”, page 263](#)

⇒ [“1.1.2 Installation location overview - engine compartment left \(Octavia II, Superb II and Yeti\)”, page 265](#)

⇒ [“1.1.3 Installation location overview - engine compartment \(Rapid\)”, page 266](#)

⇒ [“1.1.4 Installation location overview - engine from inlet side”, page 267](#)

⇒ [“1.1.5 Installation location overview - engine at gearbox end”, page 268](#)

1.1.1 Installation location overview - engine compartment right (Octavia II, Superb II and Yeti)

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1 - Control valve for fuel pressure - N276-

2 - High pressure pump with fuel pressure regulating valve - N276-

- ☐ removing and installing
⇒ ["7.2 Removing and installing the high pressure pump", page 299](#)

3 - Activated charcoal filter solenoid valve 1 - N80-

4 - Intake manifold pressure sender - G71- with intake air temperature sender - G42- .

5 - Engine control unit - J623-

- ☐ removing and installing:

- ◆ Octavia II
⇒ ["6.1.1 Removing and installing engine control unit J623 \(Octavia II\)", page 292](#)
- ◆ Superb II and Yeti
⇒ ["6.1.2 Removing and installing engine control unit J623 \(Superb II, Yeti\)", page 293](#)

6 - Knock sensor 1 - G61-

- ☐ at rear cylinder block
- ☐ 20 Nm

7 - Engine speed sender - G28-

- ☐ removing and installing
⇒ ["1.3 Removing and installing engine speed sender G28", page 316](#)

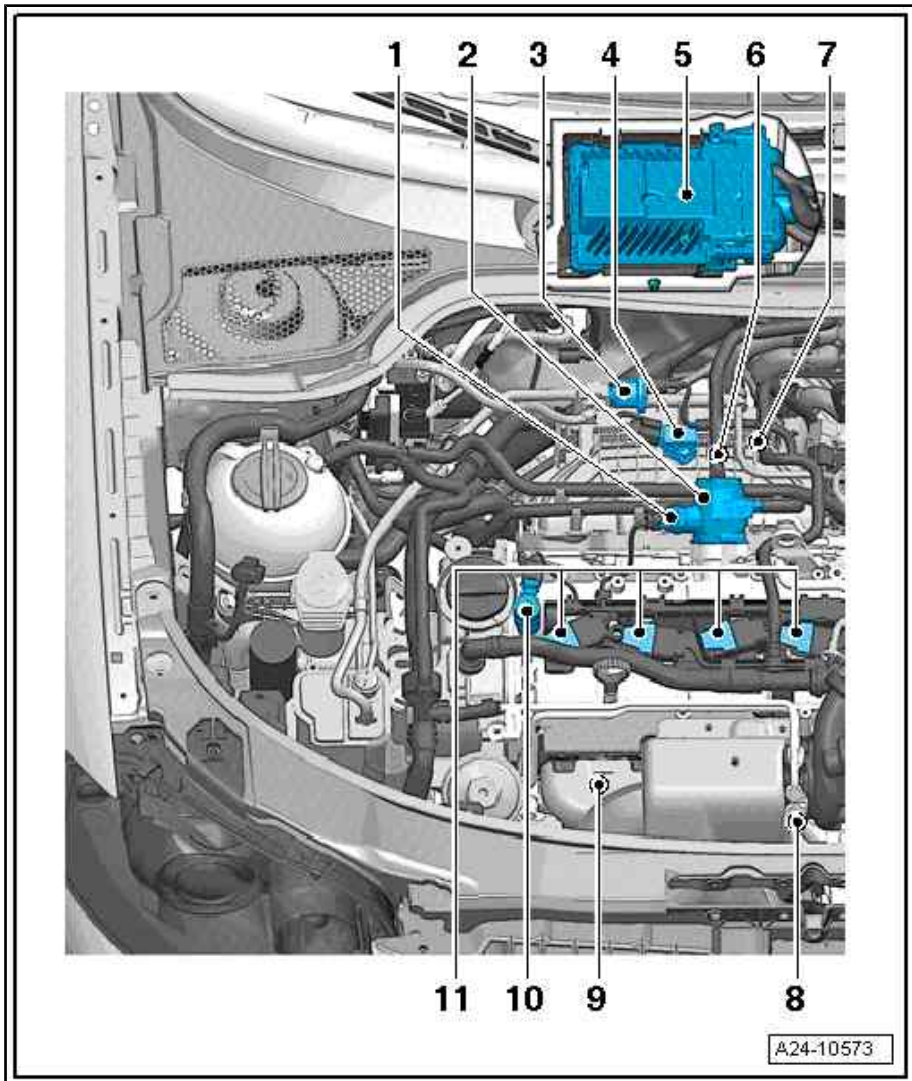
8 - Lambda probe - G39-

9 - Lambda probe after catalytic converter - G130-

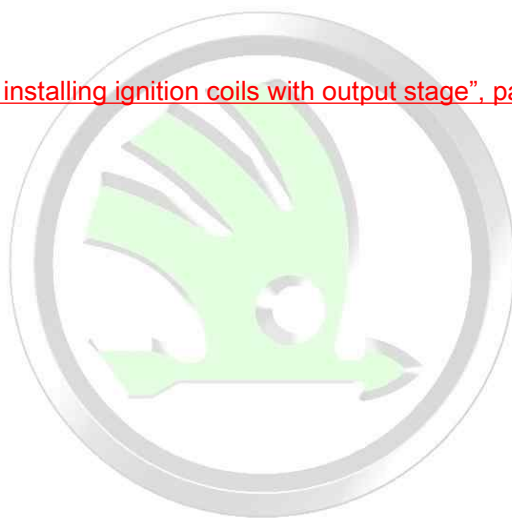
10 - Inlet camshaft control valve 1 - N205-

11 - Ignition coils with a power output stage

- ☐ removing and installing ⇒ ["1.2 Removing and installing ignition coils with output stage", page 315](#)



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1.1.2 Installation location overview - engine compartment left (Octavia II, Superb II and Yeti)

1 - Hall sender - G40-

2 - Throttle valve control unit - J338-

- ☐ removing and installing
⇒ ["4.3 Removing and installing the throttle valve control unit J338"](#), page 282
- ☐ cleaning
⇒ ["4.4 Clean throttle valve control unit J338"](#), page 284
- ☐ in case of replacement, erase initialisation values and adapt the engine control unit - J623-
⇒ Vehicle diagnostic tester.

3 - Fuel pressure sender - G247-

- ☐ removing and installing
⇒ ["5.1 Removing and installing fuel pressure sender G247"](#), page 286
- ☐ checking
⇒ ["5.2 Check fuel pressure sender G247"](#), page 287 .

4 - Charge pressure sender - G31- with intake air temperature sender 2 - G299-

5 - Clutch position sender - G476-

- ☐ for vehicles with manual gearbox
- ☐ in footwell on the clutch pedal

6 - Coolant temperature sender at radiator outlet - G83-

7 - Coolant temperature sender - G62-

8 - Lambda probe plug connections

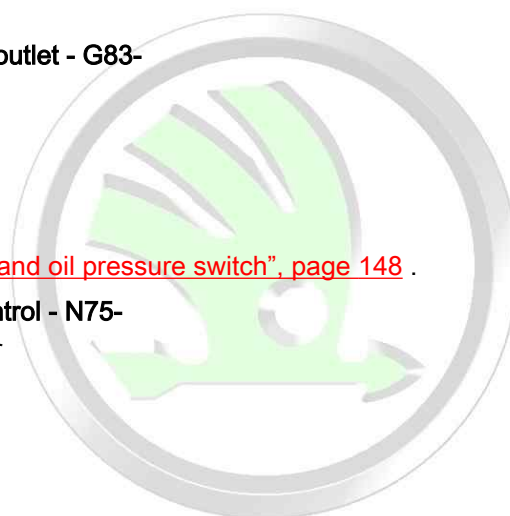
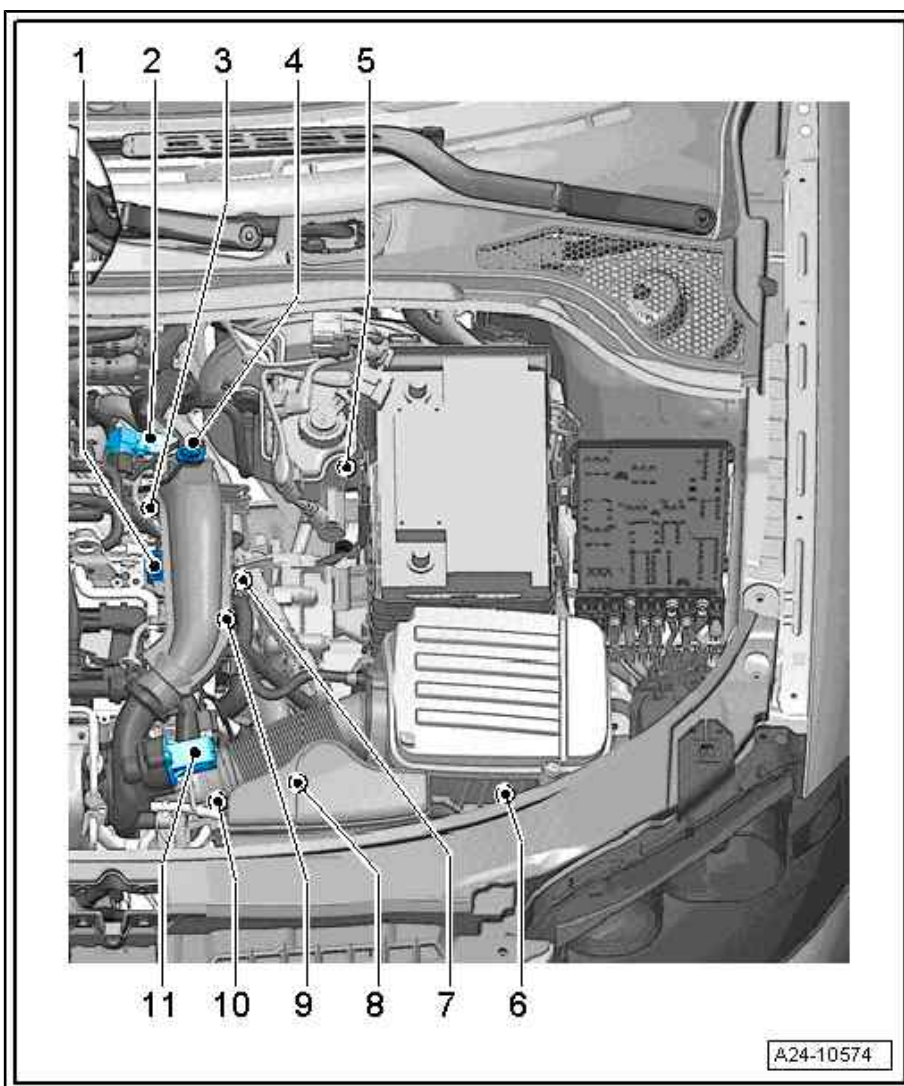
9 - Oil pressure switch - F1-

- ☐ in the left cylinder head
- ☐ checking ⇒ ["3.1 Testing oil pressure and oil pressure switch"](#), page 148 .

10 - Solenoid valve for charge pressure control - N75-

- ☐ screwed to exhaust gas turbocharger

11 - Turbocharger divert air valve - N249-





1.1.3 Installation location overview - engine compartment (Rapid)

The components A to C are not represented in the overview figure.

**A - Brake light switch - F- /
brake pedal switch - F63-**

- ☐ in footwell on the brake pedal

**B - Accelerator pedal position
sender - G72- and accelerator
pedal position sender 2 -
G185-**

- ☐ in footwell on the accelerator pedal

**C - Clutch position sender -
G476-**

- ☐ for vehicles with manual gearbox
- ☐ in footwell on the clutch pedal

**1 - Vacuum pump for brakes -
V192-**

**2 - Inlet camshaft control valve
1 - N205-**

3 - Injector, cylinder 1 - N30-

4 - Injector, cylinder 2 - N31-

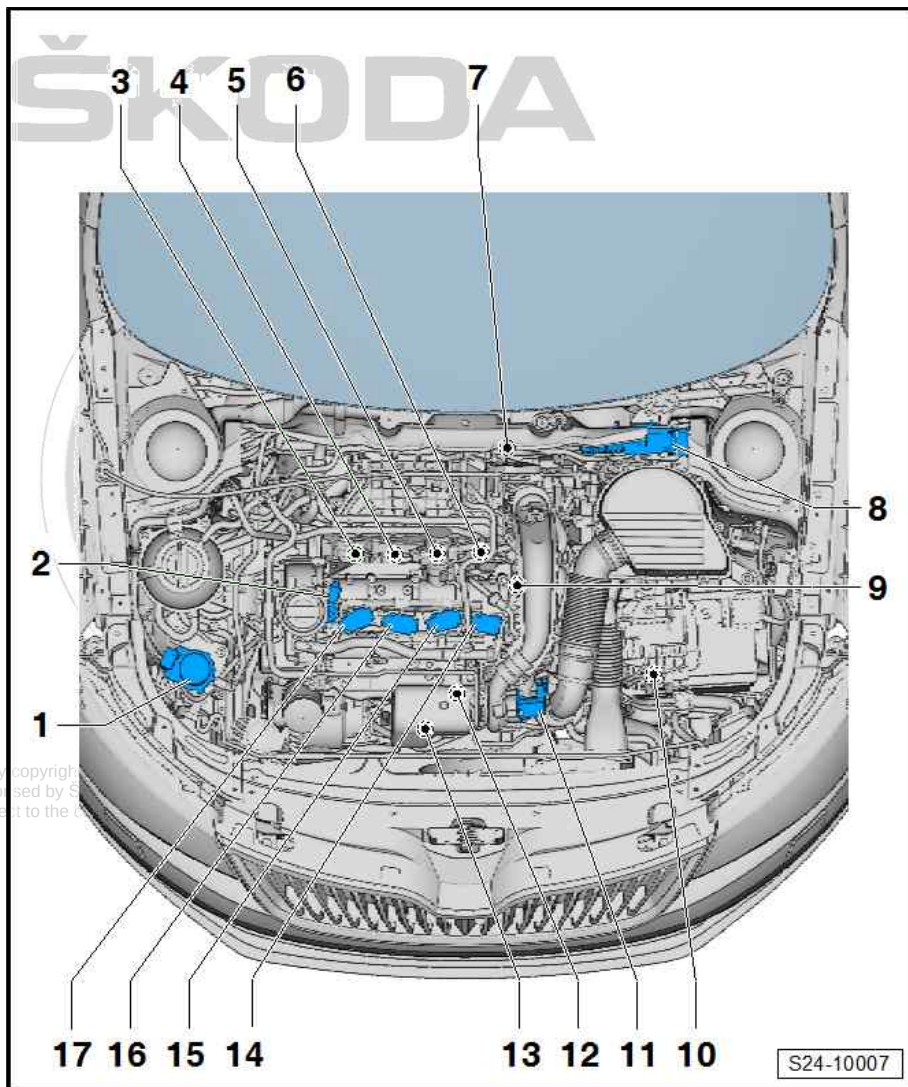
5 - Injector, cylinder 3 - N32-

6 - Injector, cylinder 4 - N33-

**7 - Pressure sensor for the
brake servo unit - G294-**

8 - Engine control unit - J623-

- ☐ removing and installing
⇒ ["6.1.3 Removing and
installing the engine
control unit J623 \(Rapid](#)



[NH\)", page 295](#)

9 - Hall sender - G40-

10 - Gearbox neutral position sender - G701-

- ☐ for vehicles with manual gearbox

11 - Turbocharger divert air valve - N249-

12 - Lambda probe after catalytic converter - G130-

13 - Lambda probe - G39-

14 - Ignition coil 4 with output stage - N292-

- ☐ removing and installing ⇒ ["1.2 Removing and installing ignition coils with output stage", page 315](#)

15 - Ignition coil 3 with output stage - N291-

- ☐ removing and installing ⇒ ["1.2 Removing and installing ignition coils with output stage", page 315](#)

16 - Ignition coil 2 with output stage - N127-

- ☐ removing and installing ⇒ ["1.2 Removing and installing ignition coils with output stage", page 315](#)

17 - Ignition coil 1 with output stage - N70-

- ☐ removing and installing ⇒ ["1.2 Removing and installing ignition coils with output stage", page 315](#)

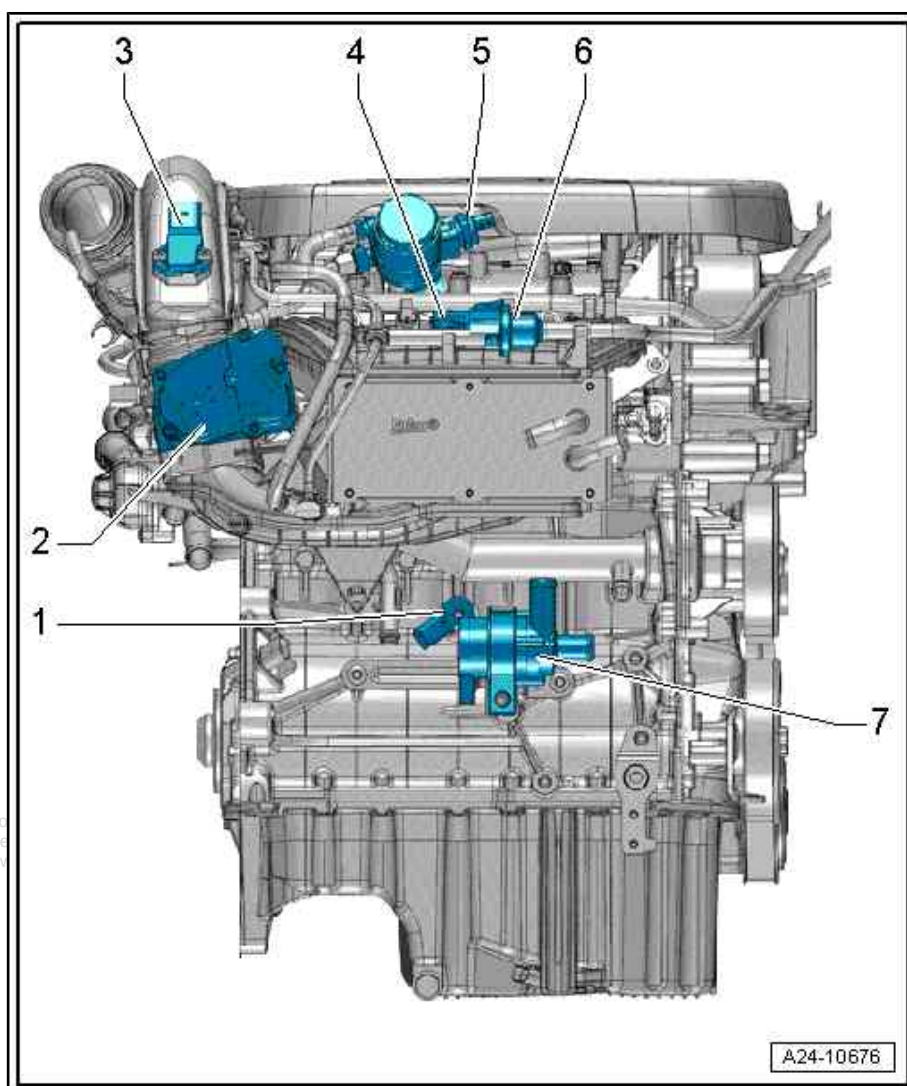
1.1.4 Installation location overview - engine from inlet side

1 - Knock sensor 1 - G61-

- ☐ Summary of components
⇒ ["1.1 Assembly overview - ignition system", page 314](#)

2 - Throttle valve control unit - J338-

- ☐ removing and installing
⇒ ["4.3 Removing and installing the throttle valve control unit J338", page 282](#)
- ☐ cleaning
⇒ ["4.4 Clean throttle valve control unit J338", page 284](#)
- ☐ in case of replacement, erase initialisation values and adapt the engine control unit - J623-
⇒ Vehicle diagnostic tester.





- 3 - Charge pressure sender - G31- with intake air temperature sender 2 - G299-
- 4 - Intake manifold pressure sender - G71- with intake air temperature sender - G42- .
- 5 - Control valve for fuel pressure - N276-
- 6 - Activated charcoal filter solenoid valve 1 - N80-
- 7 - Coolant recirculation pump - V50-
- ☐ removing and installing ⇒ ["2.3.1 Removing and installing coolant recirculation pump V50", page 162](#)

1.1.5 Installation location overview - engine at gearbox end

1 - Solenoid valve for charge pressure control - N75-

- ☐ screwed to exhaust gas turbocharger

2 - Oil pressure switch - F1-

- ☐ checking
⇒ ["3.1 Testing oil pressure and oil pressure switch", page 148](#) .

3 - Coolant temperature sender - G62-

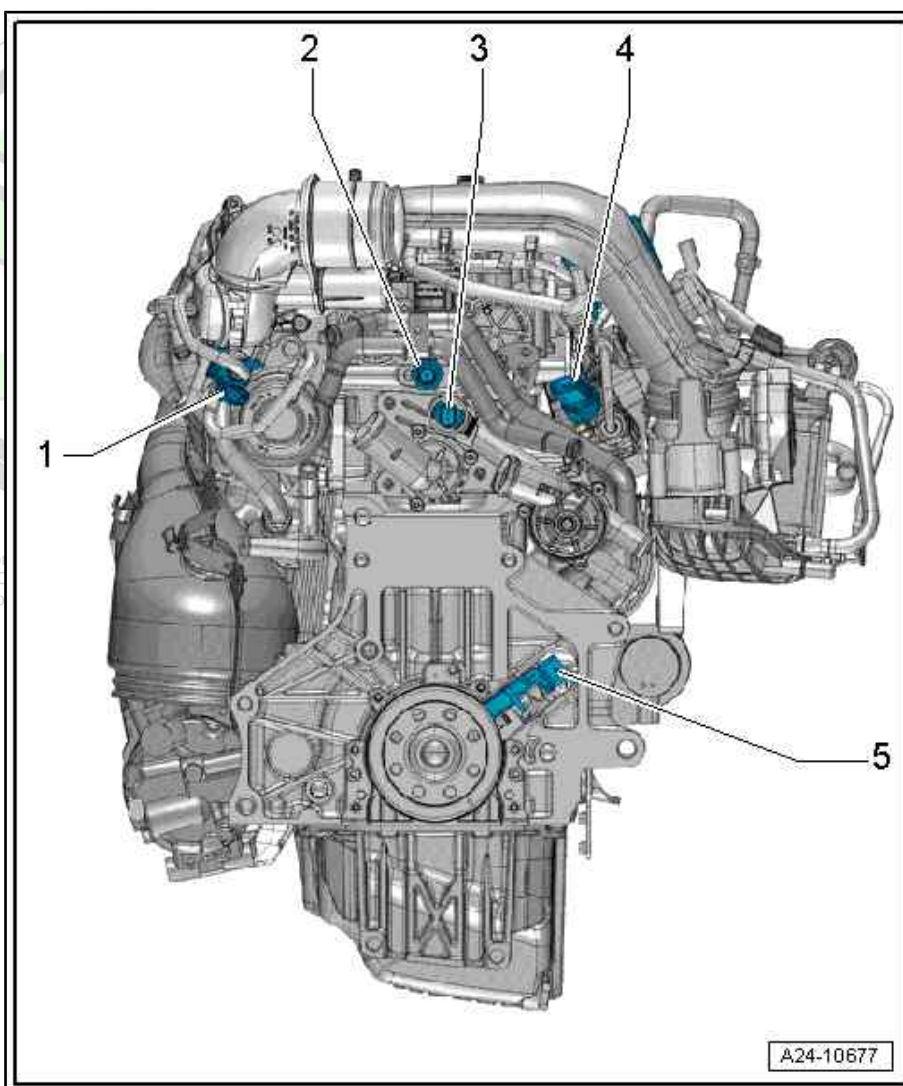
4 - Fuel pressure sender - G247-

- ☐ removing and installing
⇒ ["5.1 Removing and installing fuel pressure sender G247", page 286](#)
- ☐ checking
⇒ ["5.2 Check fuel pressure sender G247", page 287](#) .

5 - Engine speed sender - G28-

- ☐ Summary of components:

- ◆ ⇒ ["1.1 Assembly overview - ignition system", page 314](#)
- ◆ ⇒ ["2.1 Assembly overview - cylinder block, gearbox end", page 62](#)
- ☐ removing and installing
⇒ ["1.3 Removing and installing engine speed sender G28", page 316](#)



1.2 Reduce fuel pressure



Caution

The injection system consists of a high pressure part (max. pressure of 20 MPa = 200 bar) and a low pressure part (pressure of approx. 0.7 MPa = 7 bar).

Before opening the high pressure system, e.g. removing the high pressure pump, the fuel distributor, the injection valves, the fuel pipes or the fuel pressure sender - G247- , the fuel pressure in the high pressure system must be reduced to a defined residual pressure of approx. 0.7 MPa (7 bar).

- Connect the ➔ Vehicle diagnostic tester and carry out the targeted function "remove high fuel pressure".
- The fuel pressure drops to a predetermined value.
- Switch off ignition.
- Interrupt the supply voltage to the fuel pump before opening the fuel system
⇒ "2.1 Safety precautions when working on fuel supply system", page 3 .
- Before opening the high pressure system, lay cleaning cloths around the connection point.
- Open fuel system carefully to reduce the residual pressure of 0.7 MPa (7 bar) and when doing so collect fuel that is flowing out.



Note

- ◆ *If the high-pressure system is not opened immediately the pressure increases again as a result of the reheating effect.*
- ◆ *The ignition system must no longer be switched on, since otherwise the pressure will increase again.*
- ◆ *Interrogate the event memory of the engine control unit at the end of the following work and delete all the event memory entries.*
- ◆ *The readiness code must be generated if the event memory has been cleared ➔ Vehicle diagnostic tester.*

2 Injectors

⇒ [“2.1 Summary of components - injectors”, page 270](#)

⇒ [“2.2 Removing and installing injectors”, page 270](#)

⇒ [“2.3 Replacing sealing rings on injector”, page 272](#)

2.1 Summary of components - injectors

1 - O-ring

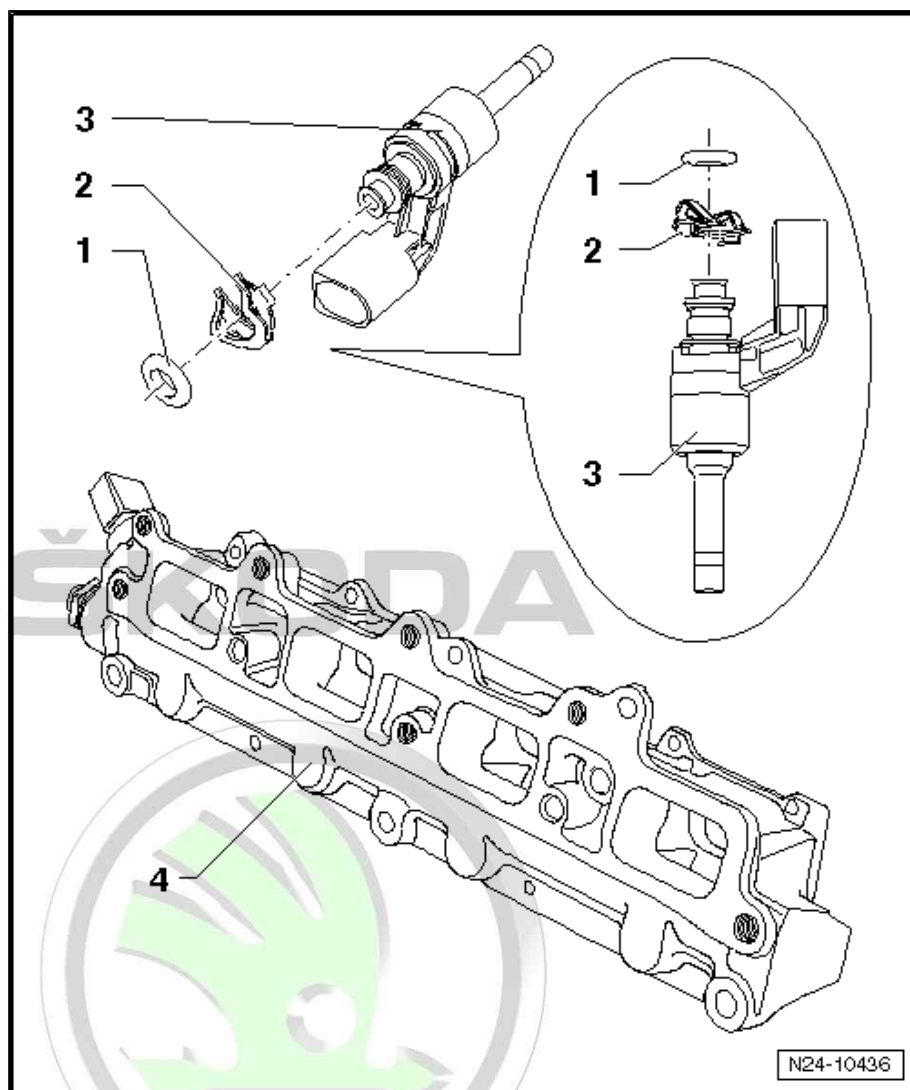
- ☐ replace
- ☐ before fitting moisten lightly with clean engine oil

2 - Spring element

- ☐ replace after each removal of the bottom part of intake manifold
- ☐ check for correct seating on injector

3 - Injector

- ☐ Injector, cylinder 1 - N30-
- ☐ Injector, cylinder 2 - N31-
- ☐ Injector, cylinder 3 - N32-
- ☐ Injector, cylinder 4 - N33-
- ☐ with Teflon gasket ring and supporting washer
- ☐ after removing the injection valve, the Teflon sealing ring and the supporting washer must be replaced
⇒ [“2.3 Replacing sealing rings on injector”, page 272](#)
- ☐ Remove and install injection valve
⇒ [“2.2 Removing and installing injectors”, page 270](#)



4 - Bottom part of intake manifold

- ☐ removing and installing ⇒ [“4.2 Removing and installing intake manifold”, page 281](#)

2.2 Removing and installing injectors

Observe the safety instructions before starting assembly work.



Note

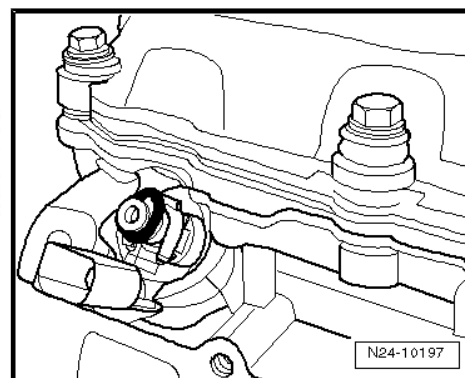
The Teflon sealing ring on the injection valve must be replaced each time after removing the injection valve
⇒ [“2.3 Replacing sealing rings on injector”, page 272](#).

Special tools and workshop equipment required

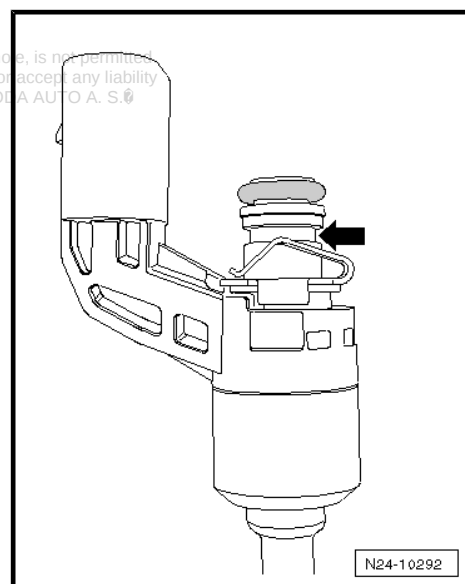
- ◆ Set of tools - T10133-

Removing

- Removing the intake manifold
⇒ ["4.2 Removing and installing intake manifold", page 281](#) .
- Remove intake manifold bottom part
⇒ ["4.1 Assembly overview - intake manifold", page 279](#) .
- Press the O-ring upwards by hand as shown and remove it from the injection valve.
- Screw position hammer - T10133/3- onto the extractor - T10133/15- .

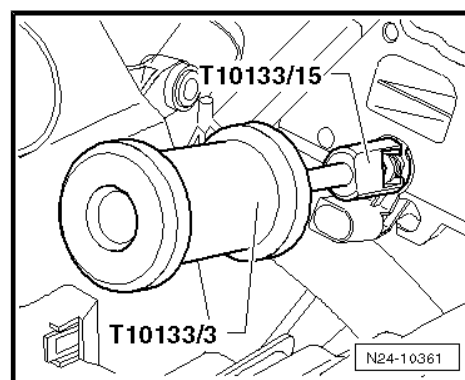


- Then insert the extractor - T10133/15- into the groove -arrow- on the injection valve.



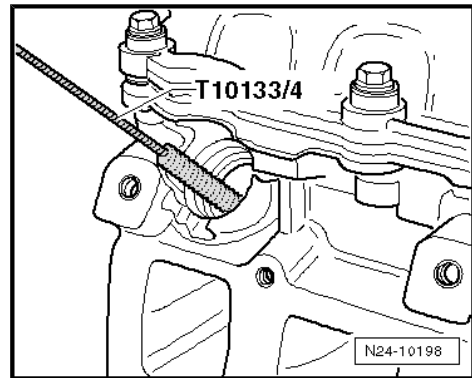
- Pull out the injection valve with careful knocks.

Install





- Thoroughly clean the holes of the injection valves in the cylinder head with the nylon brush - T10133/4- .
- Check the supporting washer made of plastic for damage, replace if necessary
⇒ [“2.3 Replacing sealing rings on injector”, page 272](#) .



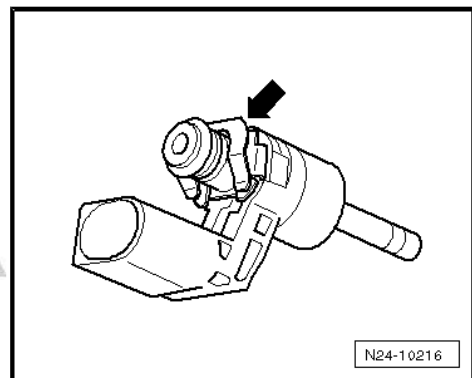
- Replace the spring element -arrow- as well as the Teflon sealing ring each time after removing the injection valves
⇒ [“2.3 Replacing sealing rings on injector”, page 272](#) .
- Replace O-rings between injection valve and bottom part of the intake manifold and moisten lightly with clean engine oil.



Note

The Teflon gasket ring of the injection valve must neither be oiled nor greased.

- Press the injection valve by hand up to the stop into the hole of the cylinder head.



Note

The injection valve must insert easily, if necessary wait until the gasket ring has been drawn together sufficiently.

- Pay attention to the correct seating and fitting position of the injection valves in the cylinder head.
- Installing the intake manifold
⇒ [“4.2 Removing and installing intake manifold”, page 281](#) .

Tightening torques

- ◆ ⇒ [“4.1 Assembly overview - intake manifold”, page 279](#)

2.3 Replacing sealing rings on injector

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Special tools and workshop equipment required

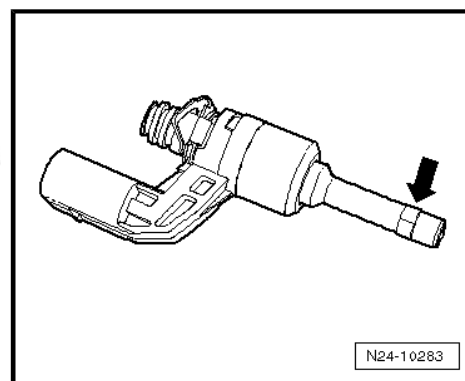
- ◆ Set of tools - T10133-

Work procedure

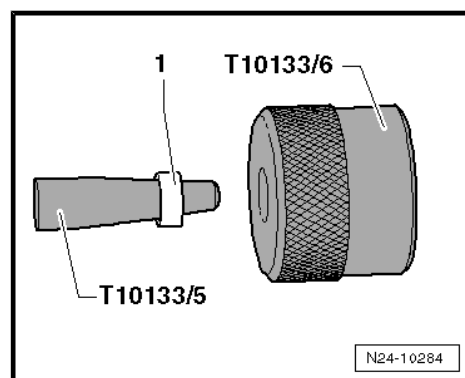
Replace Teflon gasket ring

- Remove injection valves
⇒ [“2.2 Removing and installing injectors”, page 270](#) .
- Carefully clean the injection valve.

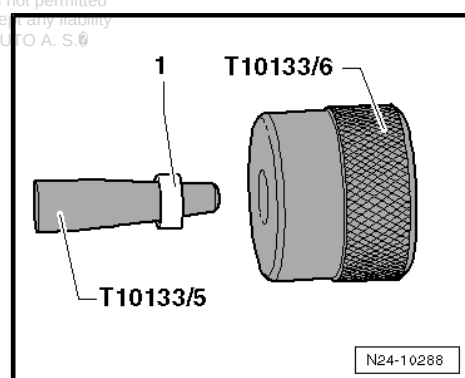
- Carefully cut open the gasket ring with a knife as shown -arrow-. Absolutely try to avoid the contact of the knife blade with the valve body.
- Remove the old gasket ring and clean the gasket ring nut in the area of the gasket ring -arrow-. Remove the existing deposits (carbon deposits) with a wire brush.



- Fit a new gasket ring -1- onto the assembly cone - T10133/5-. Slightly push the gasket ring with the assembly sleeve - T10133/6- (knurling points to the gasket ring -1-) as far as possible onto the assembly cone - T10133/5- .

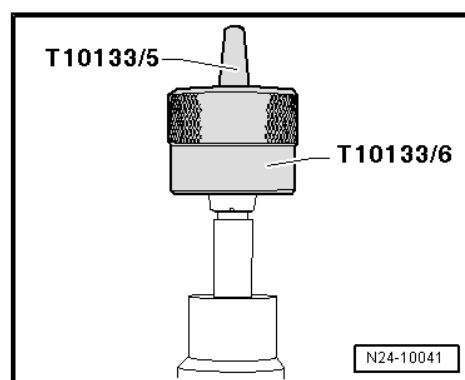


- Turn the assembly sleeve - T10133/6- around (now the knurling points away from the gasket ring), and push the gasket ring -1- up to the end onto the assembly cone - T10133/5- .
- Now position the assembly cone - T10133/5- with the gasket ring from the front onto the injection valve. Push the gasket ring with the assembly sleeve - T10133/6- further onto the injection valve.

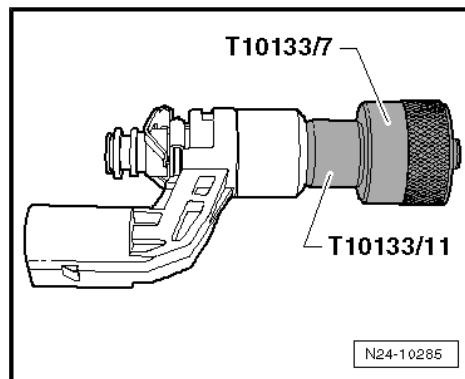


The gasket ring is not yet seated in its groove.

- Remove the assembly sleeve - T10133/6- and the assembly cone - T10133/5- .
- Push the gasket ring by hand into the annular groove.
- Fit the spacer sleeve - T10133/11- onto the valve body.



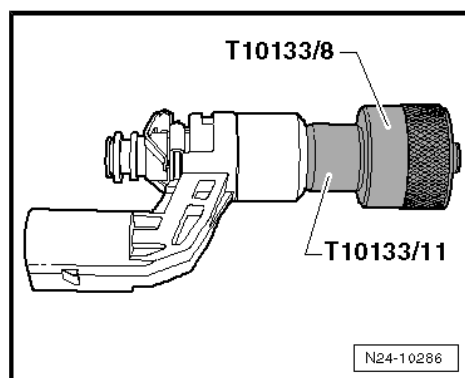
- Now press the calibration sleeve - T10133/7- via the gasket ring up to the stop at the distance sleeve - T10133/11- .
- Pull off again the calibration sleeve - T10133/7- .



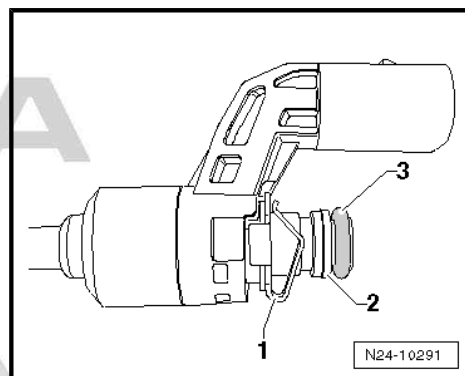
- Now press the calibration sleeve - T10133/8- via the gasket ring up to the stop at the distance sleeve - T10133/11- .
- Pull off again the calibration sleeve - T10133/8- .

Now the Teflon gasket ring has its correct fitting dimension.

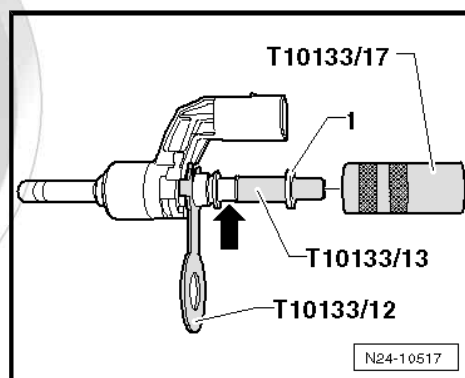
Replace supporting washer



- Remove O-ring -3-.
- Cut open the supporting washer -2- with a small side cutter and take it off.
- Pull off the spring element at the injection valve -1- and instead push on the lock washer - T10133/12- .



- Mount a new supporting washer -1- on the assembly cone - T10133/13- and fit it onto the injection valve as shown.
- Push the supporting washer -1- with the calibration sleeve - T10133/17- (knurled side points to the injection valve) up to the first nut -arrow- onto the injection valve.

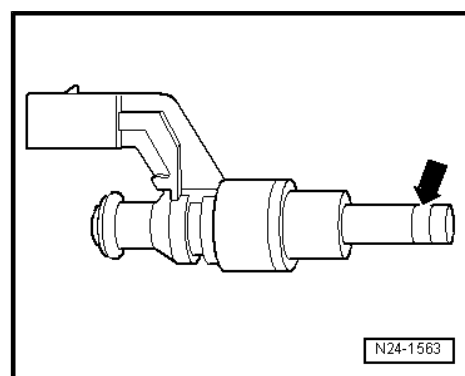
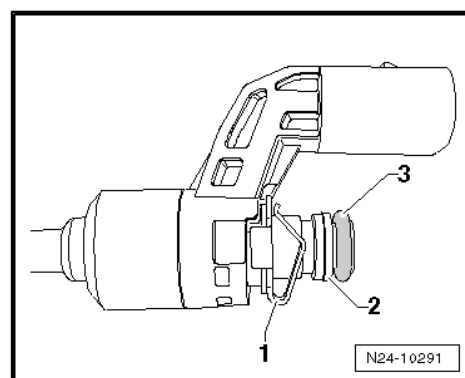
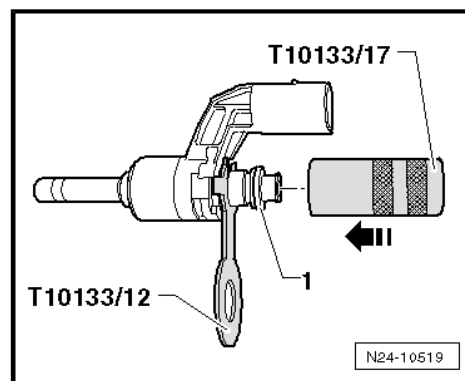


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- Now turn the calibration sleeve - T10133/17- around (knurled side points away from the injection valve). Push the calibration sleeve via the supporting washer -1- in -direction of arrow- up to the stop on the lock washer - T10133/12- .
- Pull off again the calibration sleeve - T10133/17- .

Now the supporting washer has its correct fitting dimension.

- Now fit a new spring element -1- for the lock washer - T10133/12- and push a new O-ring -3- in front of the supporting washer -2-.



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Note

The Teflon gasket ring -arrow- must not be oiled when installing the injection valve.

- Install injection valves
⇒ [“2.2 Removing and installing injectors”, page 270](#) .
- Installing the intake manifold
⇒ [“4.2 Removing and installing intake manifold”, page 281](#) .

Further installation occurs in reverse order to removal.

Tightening torques

- ◆ ⇒ [“4.1 Assembly overview - intake manifold”, page 279](#)

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3 Air filter

⇒ ["3.1 Assembly overview - air filter housing", page 276](#)

⇒ ["3.2 Removing and installing air filter housing", page 277](#)

3.1 Assembly overview - air filter housing

⇒ ["3.1.1 Summary of components - air filter housing \(Octavia II, Superb II and Yeti\)", page 276](#)

⇒ ["3.1.2 Summary of components - air filter housing \(Rapid NH\)", page 277](#)

3.1.1 Summary of components - air filter housing (Octavia II, Superb II and Yeti)

1 - Air filter top part

2 - Screw

□ 2 Nm

3 - Screw

□ 2 Nm

4 - Support

5 - Filter element

6 - Rubber-metal bearing

□ with captive screw

□ 8 Nm

7 - Seals

□ replace if damaged

8 - Air filter bottom part

□ removing and installing

⇒ ["3.2.1 Removing and installing air filter housing \(Octavia II, Superb II, Yeti\)", page 277](#)

9 - Rubber bearing

10 - Inlet connection

□ with cover

11 - Screw

□ 2 Nm

12 - Intake air duct

13 - Screw

□ 2 Nm

14 - Spring strap clamp

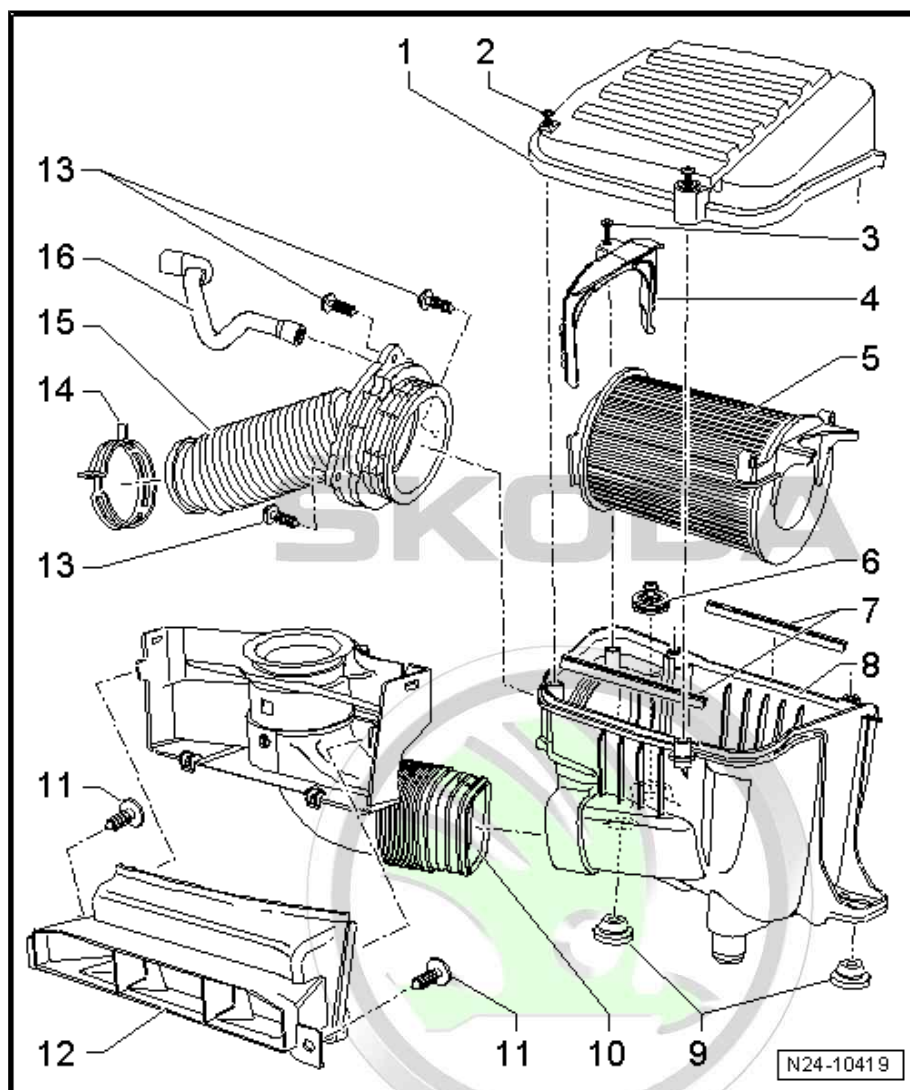
□ removing and installing with pliers for spring strap clips , e.g. -VAS 6340-

15 - Air intake hose

16 - Vacuum hose

□ replace if damaged

□ from camshaft housing



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3.1.2 Summary of components - air filter housing (Rapid NH)

1 - O-ring

- ❑ replace if damaged

2 - Inlet connection

3 - Spring strap clamp

- ❑ removing and installing with pliers for spring strap clips , e.g. -VAS 6340-

4 - Air intake hose

5 - Vacuum hose

- ❑ replace if damaged
- ❑ from camshaft housing

6 - Intake hose with support

7 - Air filter top part

8 - Screw

- ❑ 2 Nm

9 - Filter element

10 - Rubber-metal bearing

11 - Air filter bottom part

- ❑ removing and installing
⇒ ["3.2.2 Removing and installing the air filter housing \(Rapid NH\)", page 278](#)

12 - Screw

- ❑ 8 Nm

13 - Rubber-metal bearing

14 - Water drain hose

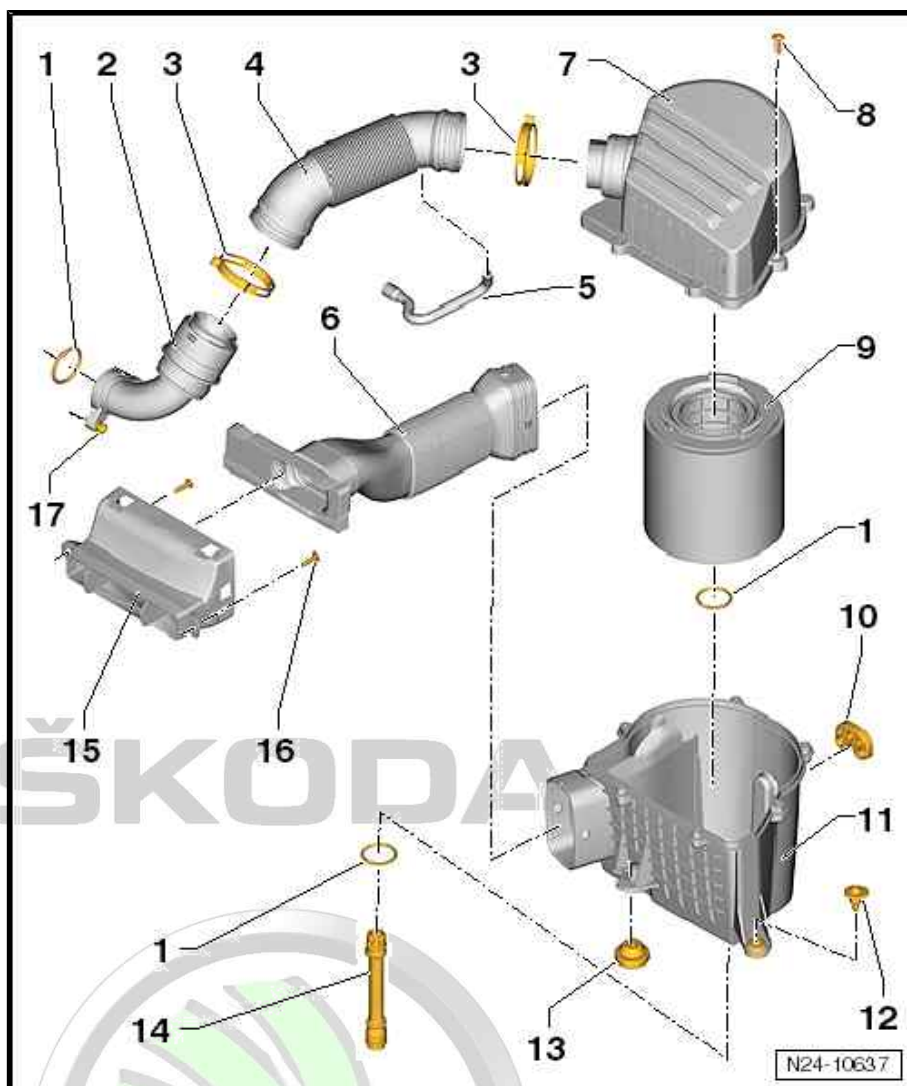
15 - Intake air duct

16 - Screw

- ❑ 3 Nm

17 - Screw

- ❑ 10 Nm



3.2 Removing and installing air filter housing

⇒ ["3.2.1 Removing and installing air filter housing \(Octavia II, Superb II, Yeti\)", page 277](#)

⇒ ["3.2.2 Removing and installing the air filter housing \(Rapid NH\)", page 278](#)

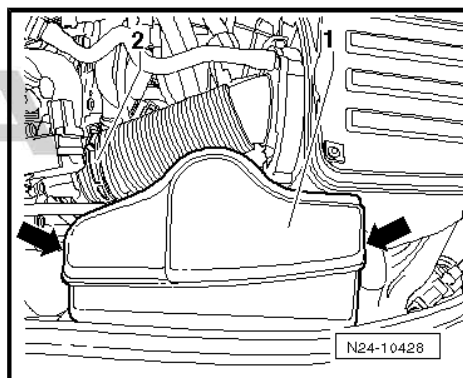
3.2.1 Removing and installing air filter housing (Octavia II, Superb II, Yeti)

Special tools and workshop equipment required

- ◆ Pliers for spring strap clips , e.g. -VAS 6340-

Removing

- Press the catches -arrows- and remove the cover -1- from the intake air duct.
- Pull the inlet connection out of the intake air duct.
- Remove the spring strap clamp -2- with the intake hose from the exhaust gas turbocharger.



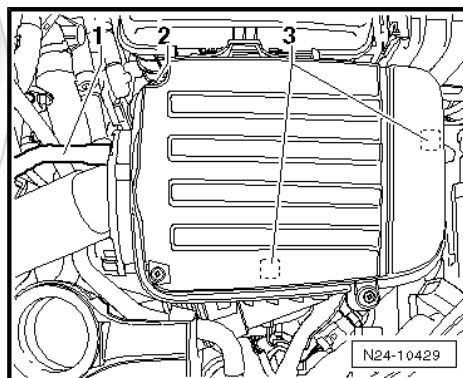
- Detach vacuum hose -1- from air filter housing.
- Unscrew the fixing screw -2- and pull the air filter housing towards the top from the bearing bolts -3-.

Install

Installation is carried out in the reverse order.

Tightening torques

- ♦ ⇒ [“3.1.1 Summary of components - air filter housing \(Octavia II, Superb II and Yeti\)”, page 276](#)



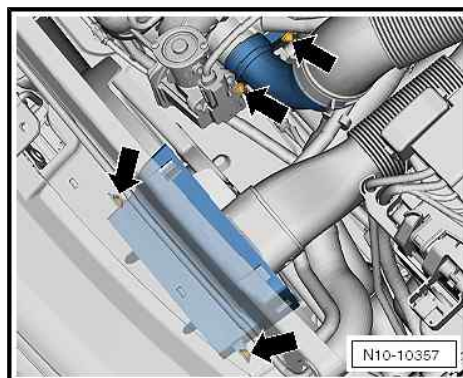
3.2.2 Removing and installing the air filter housing (Rapid NH)

Special tools and workshop equipment required

- ♦ Pliers for spring strap clips , e.g. -VAS 6340-

Removing

- Unscrew the fixing screws -arrows- of the inlet connection on the exhaust gas turbocharger and the intake air duct.



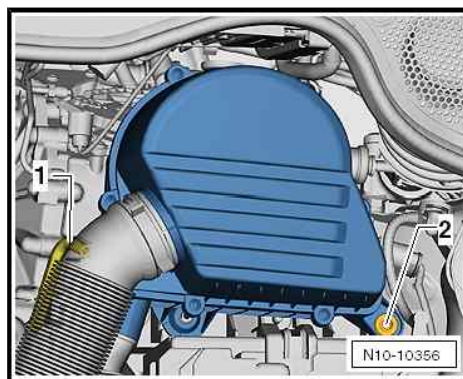
- Disconnect vacuum hose -1- from intake hose.
- Release the fixing screw -2- and pull the air filter housing towards the top from the bearing bolts.

Install

Installation is carried out in the reverse order.

Tightening torques

- ♦ ⇒ [“3.1.2 Summary of components - air filter housing \(Rapid NH\)”, page 277](#)



4 Intake manifold

⇒ ["4.1 Assembly overview - intake manifold", page 279](#)

⇒ ["4.2 Removing and installing intake manifold", page 281](#)

⇒ ["4.3 Removing and installing the throttle valve control unit J338", page 282](#)

⇒ ["4.4 Clean throttle valve control unit J338", page 284](#)

4.1 Assembly overview - intake manifold

⇒ ["4.1.1 Summary of components - intake manifold part I", page 279](#)

⇒ ["4.1.2 Summary of components - intake manifold part II", page 280](#)

4.1.1 Summary of components - intake manifold part I

1 - Connecting hose

2 - Fuel pipe

☐ High pressure

☐ Tightening torques of union nuts:

at high pressure pump:
18 Nm

at intake manifold bottom
part: 20 Nm

3 - Screw

☐ 8 Nm

4 - Grommet

5 - Fuel hose

☐ Low pressure

☐ to high pressure pump

6 - Spring strap clamp

☐ removing and installing
with pliers for spring
strap clips, e.g. -VAS
6340-

7 - Connection fittings

☐ for fuel feed line

8 - Non-return valve

☐ for crankcase ventila-
tion

9 - Screw

☐ 8 Nm

10 - O-ring

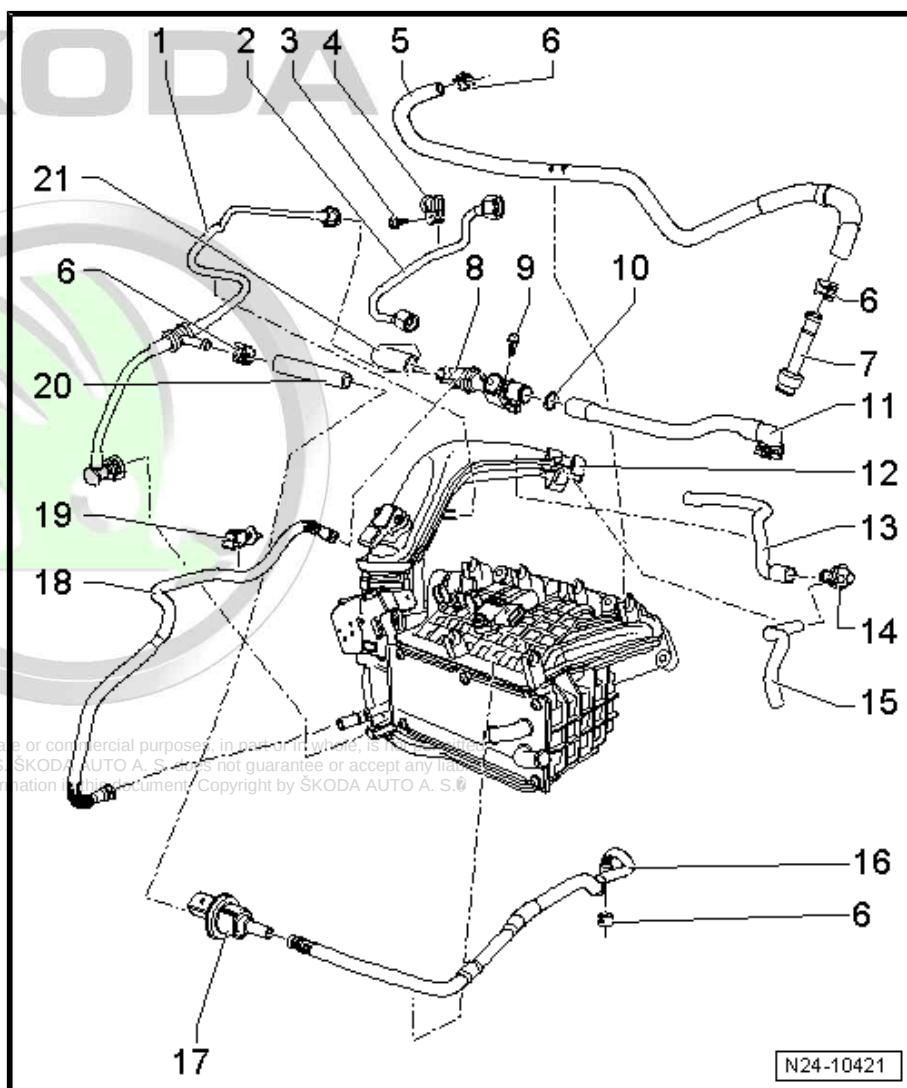
☐ replace if damaged

11 - Connection fittings

☐ at timing case

12 - Pressure pipe

☐ from exhaust turbocharger





13 - Connecting hose

- ☐ at camshaft housing

14 - Non-return valve

15 - Connecting hose

- ☐ at air filter housing

16 - Connecting hose

- ☐ at activated charcoal filter

17 - Activated charcoal filter solenoid valve 1 - N80-

18 - Connecting hose

19 - Grommet

20 - Connecting hose

21 - Connecting hose

- ☐ at exhaust gas turbocharger

4.1.2 Summary of components - intake manifold part II

1 - Retaining clip

2 - Screw

- ☐ 7 Nm

3 - Pressure pipe

4 - O-ring

- ☐ replace

5 - Charge pressure sender - G31- with intake air temperature sender 2 - G299-

6 - Screw

- ☐ 5 Nm

7 - Screw

- ☐ 7 Nm

8 - Adapter

9 - Intake manifold

- ☐ with charge air cooler
- ☐ removing and installing
⇒ ["4.2 Removing and installing intake manifold", page 281](#)

10 - Intake manifold pressure sender - G71- with intake air temperature sender - G42- .

11 - Screw

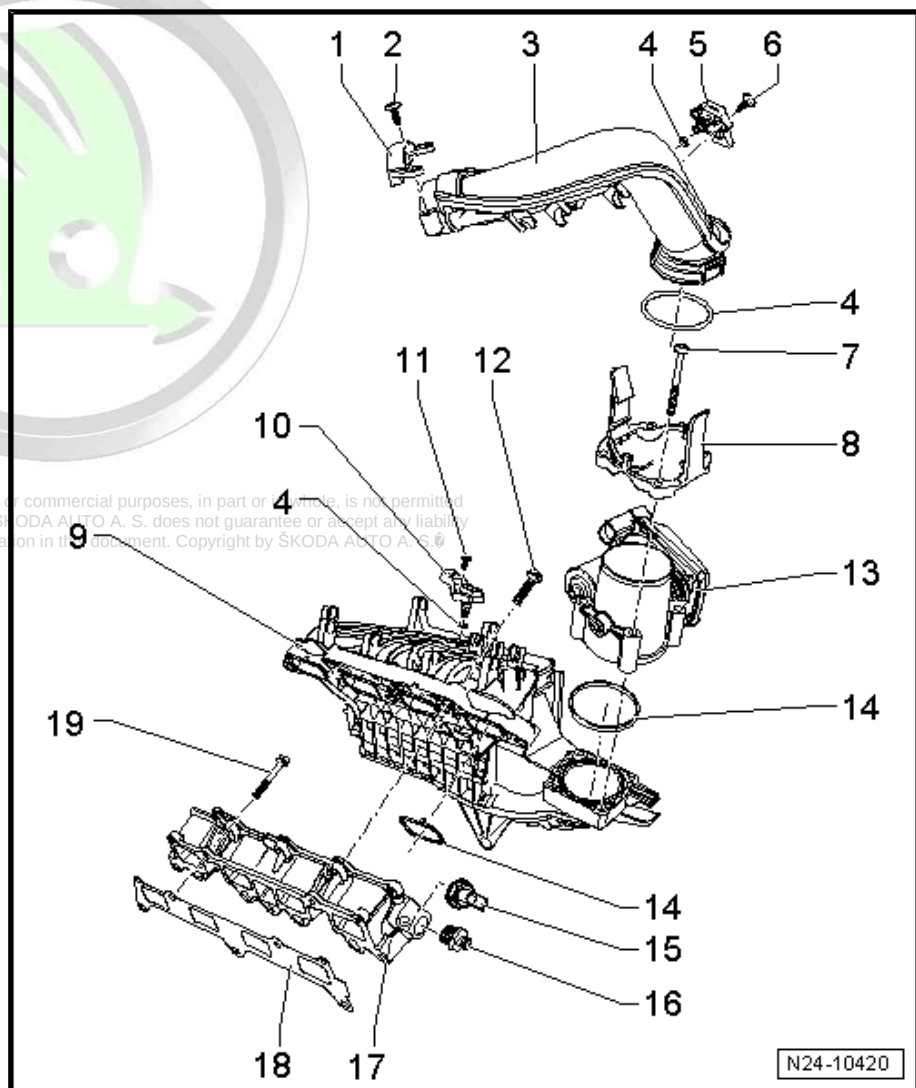
- ☐ 5 Nm

12 - Screw

- ☐ 20 Nm

13 - Throttle valve control unit - J338-

- ☐ removing and installing ⇒ ["4.3 Removing and installing the throttle valve control unit J338 ", page 282](#)
- ☐ cleaning ⇒ ["4.4 Clean throttle valve control unit J338 ", page 284](#)



- ☐ in case of replacement, erase initialisation values and adapt the engine control unit - J623- ➔ Vehicle diagnostic tester.

14 - Sealing ring

- ☐ replace

15 - Fuel pressure sender - G247-

- ☐ removing and installing ➔ ["5.1 Removing and installing fuel pressure sender G247 ", page 286](#)
- ☐ checking ➔ ["5.2 Check fuel pressure sender G247 ", page 287](#) .
- ☐ 22 Nm

16 - Adapter

- ☐ for the fuel line
- ☐ 80 Nm

17 - Bottom part of intake manifold

- ☐ removing and installing ➔ ["4.2 Removing and installing intake manifold", page 281](#)

18 - Gasket

- ☐ replace

19 - Screw

- ☐ 20 Nm

4.2 Removing and installing intake manifold

Special tools and workshop equipment required

- ◆ Pliers for spring strap clips , e.g. -VAS 6340-
- ◆ Hose clamp - MP 7-602 (3094)- 2 units
- ◆ Catch pan , e.g. -VAS 6208-

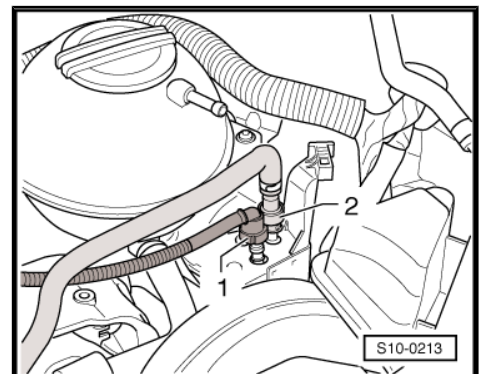


Note

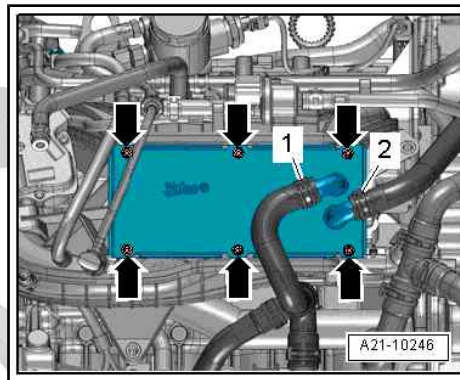
- ◆ *Safety precautions when working on the fuel supply system*
➔ ["2.1 Safety precautions when working on fuel supply system", page 3](#) .
- ◆ *Rules of cleanliness when working on the fuel supply system*
➔ ["3.1 Rules of cleanliness", page 8](#) .

Removing

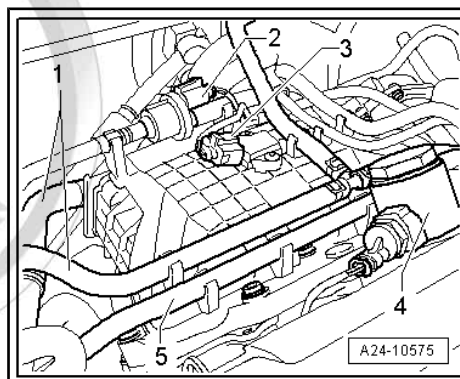
- Switch off the ignition and all electrical components and take out the ignition key.
- Remove throttle valve module
➔ ["4.3 Removing and installing the throttle valve control unit J338 ", page 282](#) .
- Disconnect the fuel feed line -2-
➔ ["3.1 Separating quick couplings", page 207](#) and catch the fuel which flows out with a cloth.
- Position the catch pan , e.g. -VAS 6208- , under the engine.



- Release coolant hoses -1- and -2- with hose clamps - MP 7-602 (3094)- and remove from charge air cooler.



- Disconnect plug connection -3- from intake manifold pressure sender - G71- .
- Expose solenoid valve 1 for activated charcoal filter - N80- -2- and lay it aside - do not disconnect either the hoses or the plug.
- Detach hoses -1- and -5- from intake manifold.



- Unscrew intake manifold fixing screws and remove the intake manifold upwards.

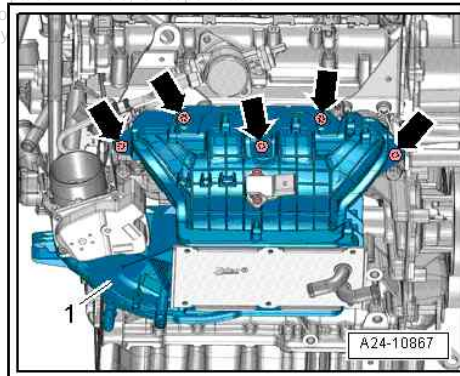
Install

Installation is performed in the reverse order, pay attention to the following points:

- Check the level of coolant and top up if necessary
⇒ [“1.3 Draining and filling coolant”, page 155](#) .

Tightening torques

- ♦ ⇒ [“4.1.1 Summary of components - intake manifold part I”, page 279](#)
- ♦ ⇒ [“4.1.2 Summary of components - intake manifold part II”, page 280](#)



4.3 Removing and installing the throttle valve control unit - J338-

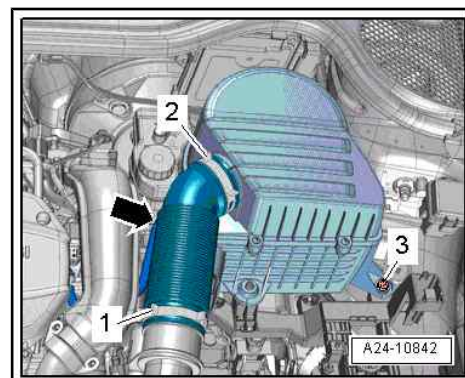
Removing

- Remove engine cover
⇒ [“3.1 Removing and installing engine trim panel”, page 48](#) .

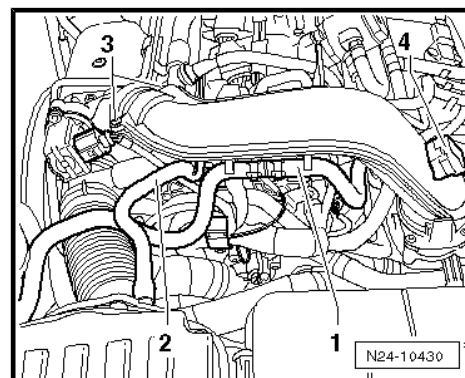
For Rapid NH vehicles

- Disconnect the vacuum hose -arrow- from the intake hose.
- Detach hose clamps -1- and -2- and remove intake hose.

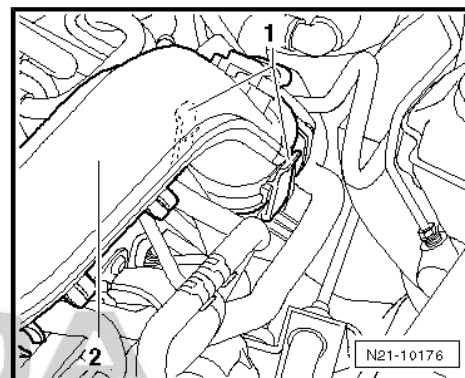
Continued for all vehicles



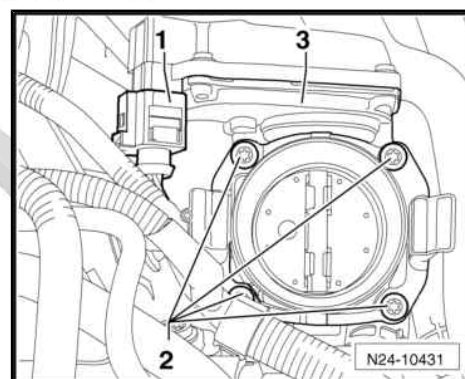
- Unhook hoses -1- and -2- on pressure pipe.
- Remove plug from charge pressure sender - G31- with intake air temperature sender 2 - G299- -4- and unscrew fixing screws -3-.



- Push holding clips -1- outwards and push the pressure pipe -2- slightly upwards.
- Then remove the pressure pipe -2- from the exhaust gas turbocharger.



- Disconnect the plug -1- from the throttle valve control unit - J338- .
- Unscrew the fixing screws -2- and remove the throttle valve control unit - J338- -3- from the intake manifold.



Install

Installation is performed in the reverse order, pay attention to the following points:

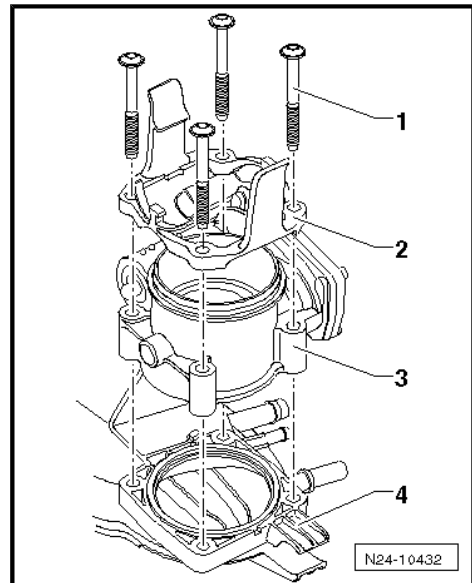


Note

- ◆ *A throttle valve control unit that has already been used must be cleaned before being installed*
⇒ *"4.4 Clean throttle valve control unit J338", page 284* .
- ◆ *Before fitting the O-rings at the exhaust turbocharger and in the pressure pipe moisten slightly with engine oil.*
- Insert a new gasket ring in the groove of the intake manifold.



- Fit throttle valve control unit - J338- -3- together with adapter -2- to the intake manifold -4-.



- Position pressure pipe -2- on exhaust gas turbocharger, then press onto the throttle valve control unit.

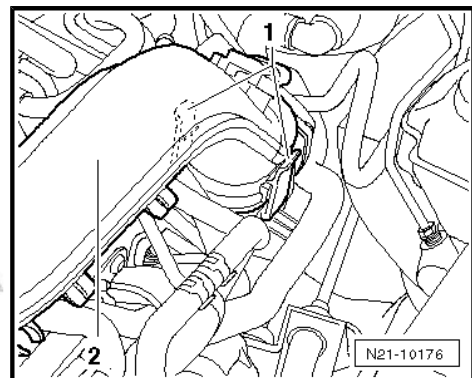


Note

During this procedure the retaining clips -1- must click audibly into place.

If a new throttle valve control unit - J338- has been installed:

- Erase initialisation values and adapt the engine control unit - J623- to the throttle valve control unit - J338- ➔ Vehicle diagnostic tester.



Tightening torques

- ♦ ➔ ["4.1.2 Summary of components - intake manifold part II", page 280](#)
- ♦ ➔ ["3.1 Removing and installing engine trim panel", page 48](#)

4.4 Clean throttle valve control unit - J338-



Note

- ♦ If a new engine control unit - J623- is fitted, the throttle valve control unit - J338- must be adapted.
- ♦ Soiling and carbonisation in the limit stop can lead to incorrect adjustment values.
- ♦ When cleaning the throttle valve housing it must not be scratched.

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Special tools and workshop equipment required

- ♦ Acetone
- ♦ Paint brush
- Remove throttle valve module - J338-
➔ ["4.3 Removing and installing the throttle valve control unit J338", page 282](#) .

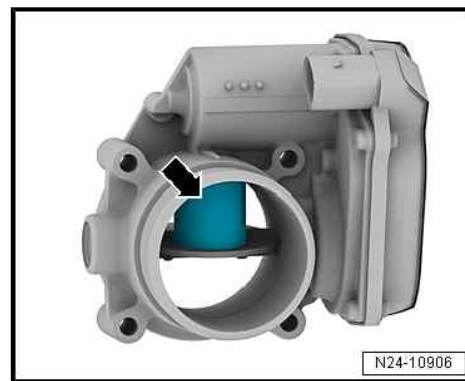
- Open throttle valve by hand and lock in open position using wood or a plastic wedge -arrow-.



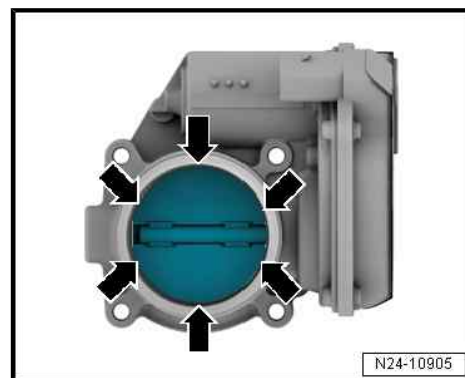
WARNING

Acetone is highly inflammable.

- ◆ *Observe the accident prevention regulations and safety instructions when handling easily inflammable fluids.*
- ◆ *Do not use compressed air when cleaning throttle valve.*
- ◆ *Wear safety goggles and safety clothing, in order to avoid injuries and skin contact with fuel.*



- Thoroughly clean the throttle valve housing using commercially available Acetone and a paint brush, particularly in the area -arrows- of the closed throttle valve.
- Wipe out throttle valve housing with a lint-free cloth.
- Allow Acetone to dry off completely.
- Install throttle valve module - J338-
⇒ ["4.3 Removing and installing the throttle valve control unit J338", page 282](#) .
- Erase initialisation values and adapt the engine control unit - J623- to the throttle valve control unit - J338- ⇒ Vehicle diagnostic tester.



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5 Senders and sensors

⇒ ["5.1 Removing and installing fuel pressure sender G247", page 286](#)

⇒ ["5.2 Check fuel pressure sender G247", page 287](#)

5.1 Removing and installing fuel pressure sender - G247-

Special tools and workshop equipment required

- ◆ Assembly tool - T10118-
- ◆ Socket insert SW 27 - T40218-

Removing



Note

- ◆ *Safety precautions when working on the fuel supply system*
⇒ ["2.1 Safety precautions when working on fuel supply system", page 3](#).
- ◆ *Rules of cleanliness when working on the fuel supply system*
⇒ ["3.1 Rules of cleanliness", page 8](#).
- Switch off the ignition and all electrical components and take out the ignition key.
- Remove engine cover
⇒ ["3.1 Removing and installing engine trim panel", page 48](#).

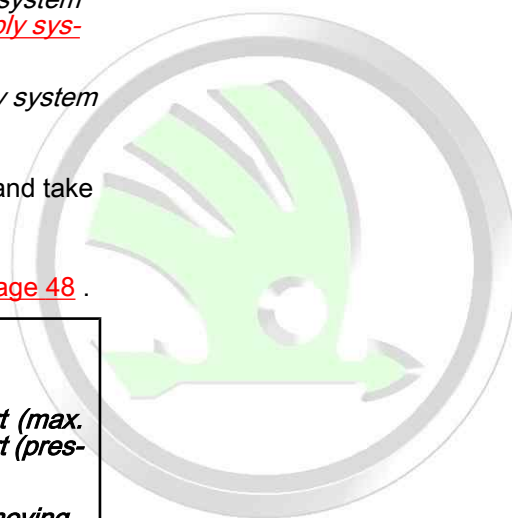


WARNING

The injection system consists of a high pressure part (max. pressure of 12 MPa = 120 bar) and a low pressure part (pressure of approx. 0.6 MPa = 6 bar).

- ◆ *Before opening the high pressure system, e.g. removing the high pressure pump, the fuel distributor, the injection valves, the fuel pipes or the fuel pressure sender - G247-, the fuel pressure in the high pressure system with a remaining pressure of approx. 0.6 MPa (6 bar) must be reduced.*
- ◆ *The procedure for this is described in the chapter "Relieving pressure in the high pressure system"*
⇒ ["1.2 Reduce fuel pressure", page 269](#).

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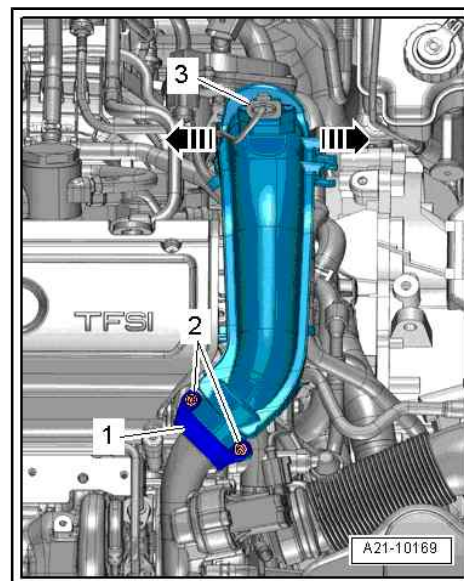
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- Unscrew screws -2- and remove retaining bracket -1-.
- Disconnect plug -3- at charge pressure sender - G31- with intake air temperature sender 2 - G299- .
- Unhook hoses from pressure pipe and open the cable guide.
- Press retaining clips -arrows- outwards and pull the pressure pipe out upwards.
- Then remove the pressure pipe from the exhaust gas turbo-charger.



Note

Hold the connections at the high pressure pump and at the bottom part of intake manifold/fuel distributor when tightening the union nuts with a wrench.

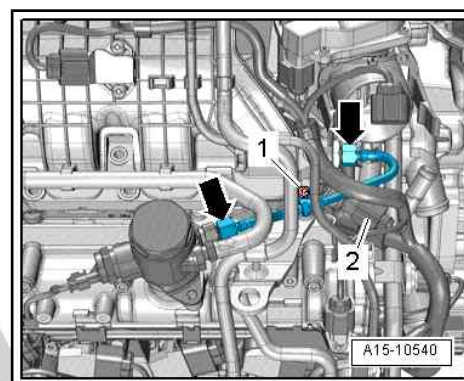


- Unscrew union nuts -arrows- and screw -1- and remove high pressure line.



Note

- ◆ *The fuel line bracket must not become bent in any circumstances.*
- ◆ *If the bracket becomes bent the fuel line must be replaced, as must the bracket.*



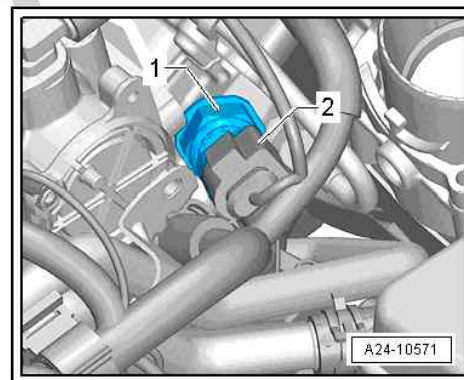
- Unlock plug of fuel pressure sender - G247- -2- using the assembly tool - T10118- .



Note

Place a cloth below to absorb leaking fuel.

- Unscrew the fuel pressure sender - G247- with socket insert size 27 - T40218- .



Install

Installation is carried out in the reverse order.

Tightening torques

- ◆ ⇒ [“4.1.2 Summary of components - intake manifold part II”, page 280](#)
- ◆ ⇒ [“3.1 Removing and installing engine trim panel”, page 48](#)

5.2 Check fuel pressure sender - G247-

If the fuel pressure sender - G247- fails, the fuel pressure regulating valve - N276- cuts out, the electric fuel pump is activated fully and the pressure in the fuel distributor is adapted to the pressure in the fuel low pressure area. This results in poor carburetion, torque reduction and irregular engine running.

Special tools and workshop equipment required



- ◆ Pressure sensor tester , e.g. -VAS 6394- (contains pressure manometer - VAS 6394/1-)
- ◆ Adapter , e.g. -VAS 6394/2-
- ◆ Test adapter , e.g. -VAS 5570-



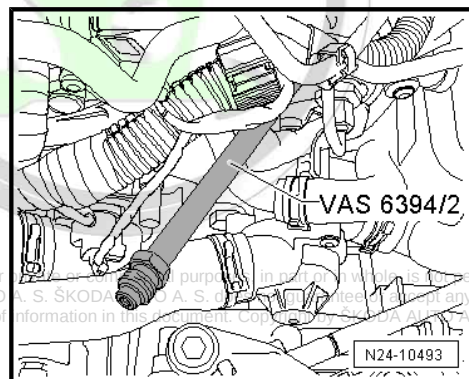
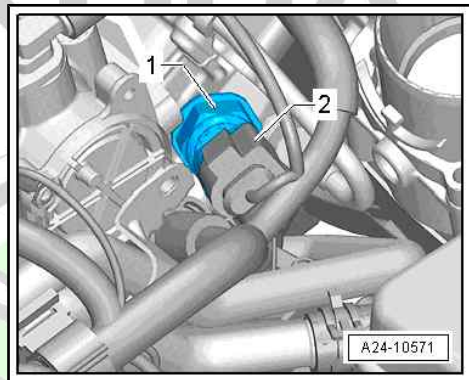
WARNING

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- ◆ *Before opening the high pressure system, e.g. removing the high pressure pump, the fuel distributor, the injection valves, the fuel pipes or the fuel pressure sender - G247-, the fuel pressure in the high pressure system with a remaining pressure of approx. 0.6 MPa (6 bar) must be reduced.*
- ◆ *The procedure for this is described in the chapter "Relieving pressure in the high pressure system"
⇒ "1.2 Reduce fuel pressure", page 269 .*

Work procedure

- Removing fuel pressure sender - G247- -1-
⇒ "5.1 Removing and installing fuel pressure sender G247 ",
page 286
- Moisten the sealing cone of the adapter - VAS 6294/2- with clean engine oil and screw it into the fuel distributor.
Tightening torque 22 Nm.

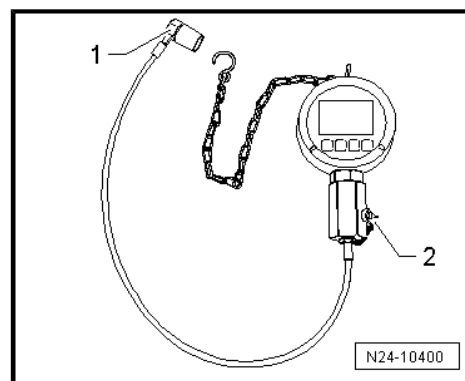


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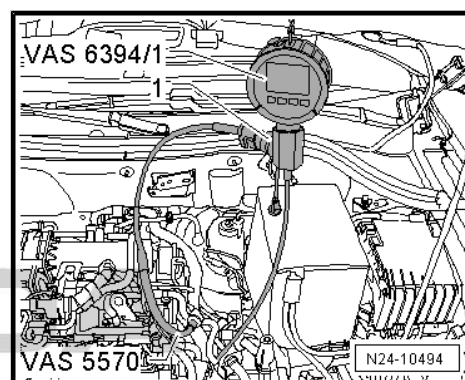
- Release the screw plug -2- and screw the fuel pressure sender - G247- into the tester - VAS 6394/1- .

Tightening torque 22 Nm.

- Screw pressure line -1- of the pressure gauge - VAS 6394/1- onto the adapter - VAS 6294/2- until hand-tight.



- Connect the test adapter - VAS 5570- to the fuel pressure sender - G247- -1- and to the plug.



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- Switch on the tester - VAS 6394/1- , for this step, briefly press the button -A- once.



Note

- ◆ *If the button -A- is pressed for 2 seconds, the illumination is switched on for 20 seconds.*
- ◆ *If the tester - VAS 6394/1- does not indicate 0 MPa (0 bar), carry out a zero point of the balance by means of the ⇒ operating instructions .*
- Connect vehicle diagnosis tester ⇒ Vehicle diagnostic tester.
- Switch on ignition.
- Perform engine control unit identification.

For vehicles with engine control unit with "KWP communication protocol"

- On the display press consecutively the following buttons:

Vehicle self-diagnosis

Self-diagnosis ▶

01 - Engine Electronics ▶

011 - Measured values ▶

- Select measured value block 1 4 0 and confirm with 0.

The actual value which is transmitted to the vehicle by the fuel pressure sender - G247- is shown in the display field 3.

For vehicles with engine control unit with "UDS communication protocol"

- On the display press consecutively the following buttons:

Targeted functions

CAXA, CAXC engine (UDS) ▶

Reading measured value block ▶

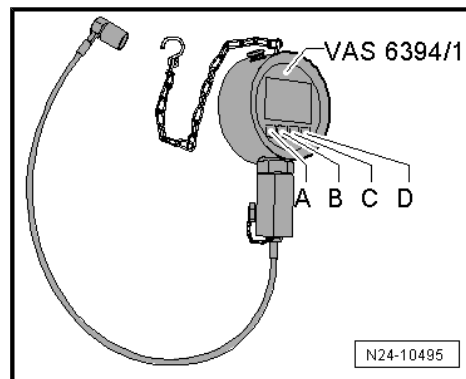
The actual value which is transmitted to the vehicle by the fuel pressure sender - G247- is shown in the display field high pressure fuel, actual value.

Continued for all vehicles

- Start engine.
- Compare the displayed pressure on the digital manometer - VAS 6394/1- with the actual value on the vehicle diagnosis, measurement and information system VAS .
- The pressures may deviate maximum 0.5 MPa (5 bar) from one another.

If the deviation is greater than 0.5 MPa (5 bar):

- Perform a vehicle diagnosis, measurement and information system VAS of the guided function "remove high fuel pressure".
- Replace fuel pressure sender - G247- .
- Repeat the test with the new fuel pressure sender - G247- and compare both measured values.



If the measured values do not correspond again:

- Perform a cable testing ⇒ Vehicle diagnostic tester.

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6 Engine control unit

⇒ ["6.1 Removing and installing engine control unit J623", page 292](#)

6.1 Removing and installing engine control unit - J623-

⇒ ["6.1.1 Removing and installing engine control unit J623 \(Octavia II\)", page 292](#)

⇒ ["6.1.2 Removing and installing engine control unit J623 \(Superb II, Yeti\)", page 293](#)

⇒ ["6.1.3 Removing and installing the engine control unit J623 \(Rapid NH\)", page 295](#)

6.1.1 Removing and installing engine control unit - J623- (Octavia II)



Note

- ◆ In order to unplug the plugs from the control unit, the control unit must always be removed.
- ◆ If the engine control unit must be replaced, connect the ⇒ Vehicle diagnostic tester and in "perform the replace engine control unit" targeted fault finding.

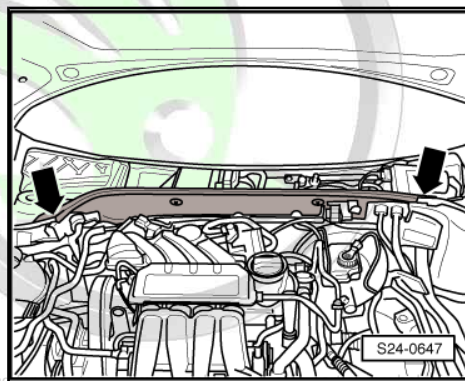
Special tools and workshop equipment required

- ◆ Body saw e.g. -V.A.G 1523A-

Removing

- Switch off ignition and pull out ignition key.
- Remove plenum chamber cover, then plenum chamber bulkhead -arrows- ⇒ Body Work; Rep. gr. 66 .

For vehicles with protective cover

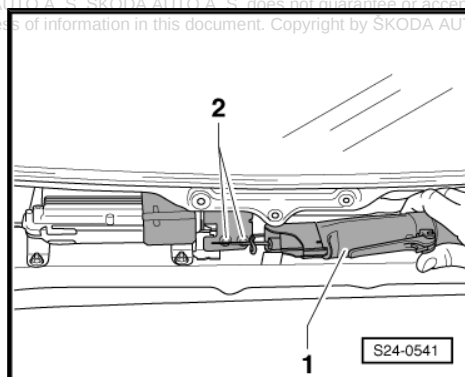


- Cut with body saw -1- a slot for the cross-head screwdriver in the heads of the pull-off screws -2-.



Note

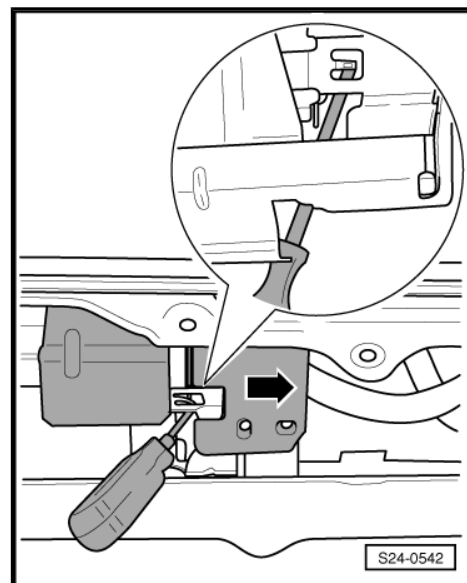
- ◆ It must be sawed twice with the body saw, so that the slot is wide enough, in order to unscrew the screws with a suitable screwdriver.
- ◆ A locking agent is applied to the pull-off screws.
- Unscrew bolts -2-.



- Lift locking tab of protective cover with a cross-head screw-driver.
- Push the protective cover in the -direction of the arrow- out of the bracket for engine control unit.

Continued for all vehicles

- Disconnect front plug -1- and remove from engine control unit.



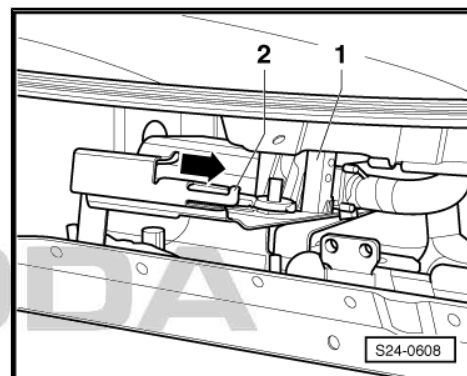
- Lever off retaining bracket -2- slightly.
- Push engine control unit out of the bracket -arrow-.
- Disconnect rear plug and remove from engine control unit.

Install



Note

For vehicles with protective cover, the metal swarfs must be suctioned out of the plenum chamber before installing the engine control unit.



- Connect rear plug to engine control unit and lock.
- Push engine control unit into the bracket and lock the retaining bracket -2-.
- Connect front plug to engine control unit and lock.

For vehicles with protective cover

- Fasten protective cover with new pull-off screws (before tightening align the protective cover in such a way that it does not come into contact with the surrounding components)

Continued for all vehicles

- Install bulkhead plenum chamber and plenum chamber cover
⇒ Body Work; Rep. gr. 66 .

6.1.2 Removing and installing engine control unit - J623- (Superb II, Yeti)



Note

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- ◆ *In order to unplug the plugs from the control unit, the control unit must always be removed.*
- ◆ *If the engine control unit must be replaced, connect the ⇒ Vehicle diagnostic tester and in "perform the replace engine control unit" targeted fault finding.*

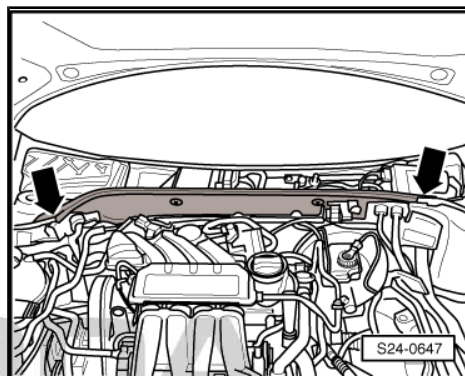
Special tools and workshop equipment required



- ◆ Body saw e.g. -V.A.G 1523A-

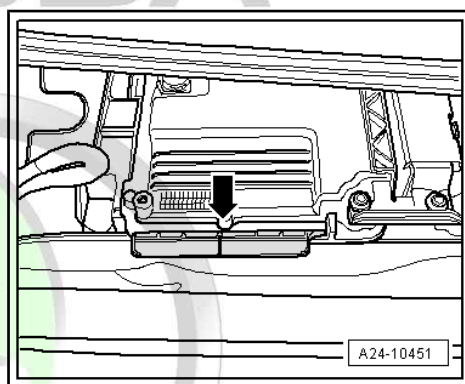
Removing

- Switch off ignition and pull out ignition key.
- Remove plenum chamber cover, then plenum chamber bulk-head -arrows- ⇒ Body Work; Rep. gr. 66 .



- Open retaining clip -arrow- and remove the engine control unit - J623- .

Vehicles with protective cover



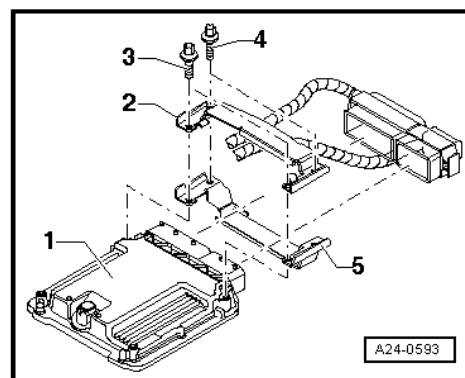
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- Cut with body saw a slot for the cross-head screwdriver in the heads of the pull-off screws -3- and -4-.



Note

- ◆ *It must be sawed 2x with the body saw, so that the slot is wide enough, in order to be able to unscrew the screws with a suitable screwdriver.*
- ◆ *A locking agent is applied to the pull-off screws.*
- Unscrew the screws and remove the protective cover for the plug connections -2- and -5-.



Continued for all vehicles

- Unlock both plugs at engine control unit and unplug.

Install



Note

For vehicles with protective cover, the metal swarfs must be suctioned out of the plenum chamber before installing the engine control unit.

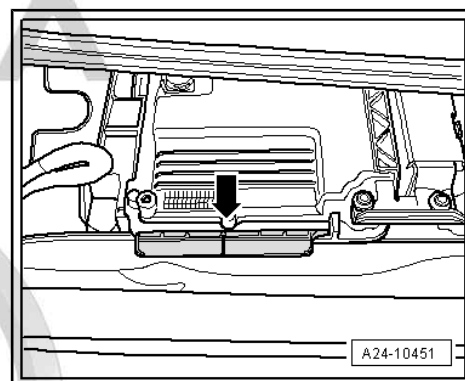
- Connect both plugs and lock.

Vehicles with protective cover

- Fasten protective covers with new pull-off screws.
- Tighten pull-off screws evenly until the heads are pulled off.

Continued for all vehicles

- Push engine control unit into the bracket and lock with retaining clip -arrow-.
- Install bulkhead plenum chamber and plenum chamber cover
⇒ Body Work; Rep. gr. 66 .



6.1.3 Removing and installing the engine control unit - J623- (Rapid NH)



Note

- ◆ *In order to unplug the plugs from the control unit, the control unit must always be removed.*
- ◆ *If the engine control unit must be replaced, connect the ⇒ Vehicle diagnostic tester and in "perform the replace engine control unit" targeted fault finding.*

Special tools and workshop equipment required

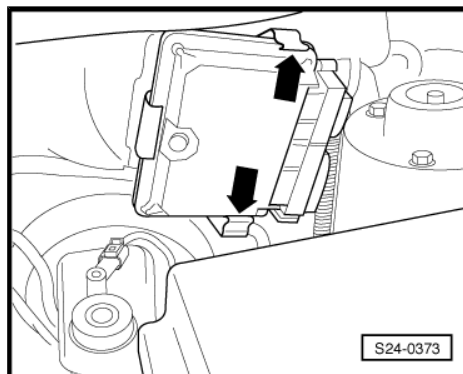


- ◆ Body saw e.g. -V.A.G 1523A-

Removing

- Switch off ignition and pull out ignition key.
- Press bracket -arrows- outwards and pull the engine control unit out sideways.

For vehicles with protective cover



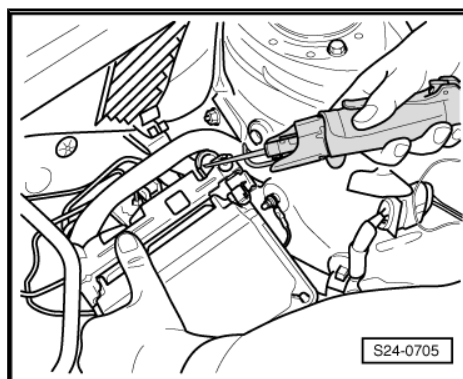
- Cut with body saw a slot for the cross-head screwdriver in the heads of the pull-off screws.



Note

- ◆ *It must be sawed twice with the body saw, so that the slot is wide enough, in order to unscrew the screws with a suitable screwdriver.*
- ◆ *A locking agent is applied to the pull-off screws.*

- Screw out the screws.
- Remove protective cover of control unit.



Continued for all vehicles

- Disconnect plug at engine control unit and unplug.

Install



Note

For vehicles with protective cover, the metal swarfs must be suctioned out of the plenum chamber before installing the engine control unit.

Connect both plugs and lock.

For vehicles with protective cover

- Insert protective cover and fix with new pull-off screws at engine control unit.

Continued for all vehicles

- Insert the control unit into the pressure retaining clips on the body.

7 High pressure pump

⇒ [“7.1 Summary of components - high pressure pump”, page 297](#)

⇒ [“7.2 Removing and installing the high pressure pump”, page 299](#)

7.1 Summary of components - high pressure pump



WARNING

The injection system consists of a high pressure part (max. pressure of 12 MPa = 120 bar) and a low pressure part (pressure of approx. 0.6 MPa = 6 bar).

- ◆ *Before opening the high pressure system, e.g. removing the high pressure pump, the fuel distributor, the injection valves, the fuel pipes or the fuel pressure sender - G247-, the fuel pressure in the high pressure system with a remaining pressure of approx. 0.6 MPa (6 bar) must be reduced.*
- ◆ *The procedure for this is described in the chapter “Relieving pressure in the high pressure system”
⇒ [“1.2 Reduce fuel pressure”, page 269](#).*

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1 - Screw

- ☐ Replace after disassembly
- ☐ 20 Nm

2 - Fuel hose

- ☐ Low pressure

3 - Spring strap clamp

- ☐ removing and installing with pliers for spring strap clips , e.g. -VAS 6340-

4 - Union nut

- ☐ hold the connection fitting on the high pressure pump for loosening
- ☐ Observe high pressure pipe part number ⇒ ET-KA - Electronic Catalogue of Original Parts
- ☐ Tightening torque:

◆ until 02.10.2011: 25 Nm

◆ from 03.10.2011: 14 Nm

5 - Union nut

- ☐ hold the connection fitting on the high pressure pump for loosening
- ☐ Observe high pressure pipe part number ⇒ ET-KA - Electronic Catalogue of Original Parts
- ☐ Tightening torque:

◆ until 02.10.2011: 25 Nm

◆ from 03.10.2011: 14 Nm

6 - High pressure pump with fuel pressure regulating valve - N276-

- ☐ removing and installing ⇒ ["7.2 Removing and installing the high pressure pump", page 299](#)

7 - O-ring

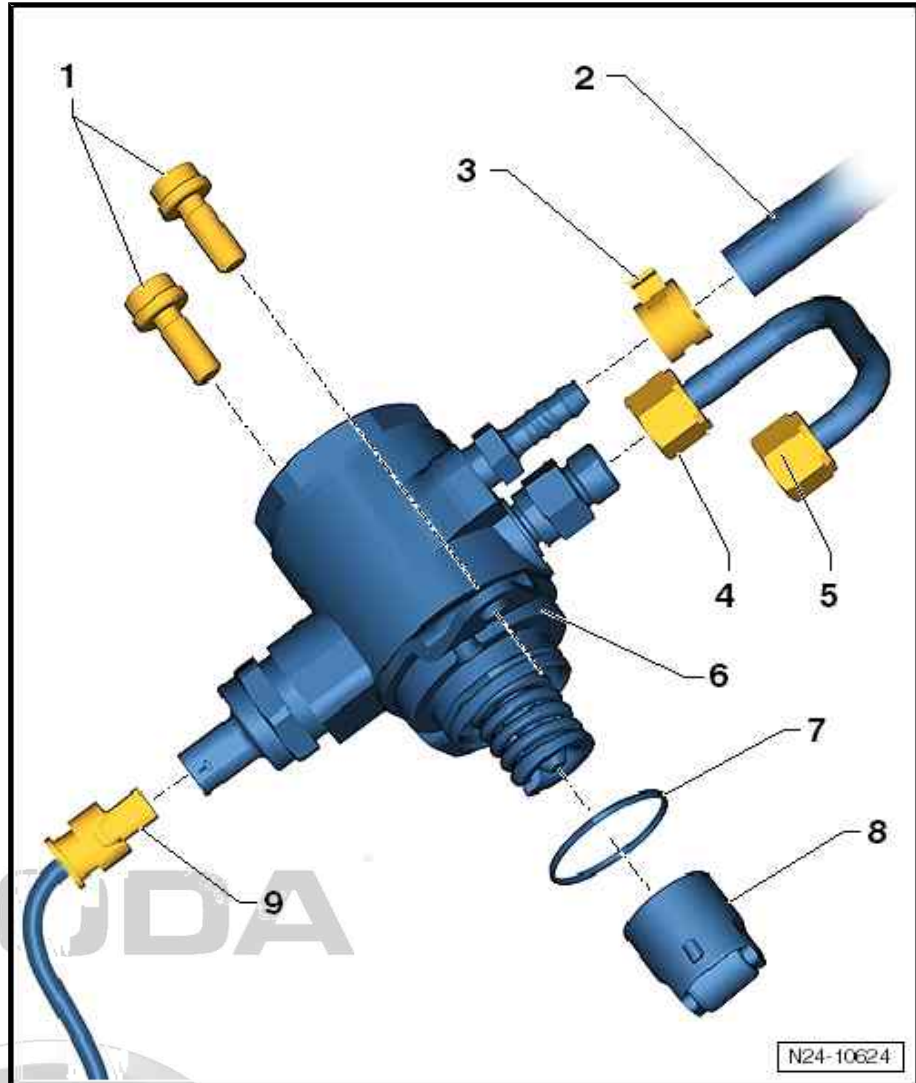
- ☐ Replace after disassembly
- ☐ before fitting moisten lightly with clean engine oil

8 - Roller tappet

- ☐ before fitting moisten lightly with clean engine oil

9 - Connector

- ☐ for fuel pressure regulating valve - N276-



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7.2 Removing and installing the high pressure pump

Removing



Note

- ◆ *Safety precautions when working on the fuel supply system*
⇒ *"2.1 Safety precautions when working on fuel supply system", page 3*.
- ◆ *Rules of cleanliness when working on the fuel supply system*
⇒ *"3.1 Rules of cleanliness", page 8*.
- Switch off the ignition and all electrical components and take out the ignition key.



WARNING

The injection system consists of a high pressure part (max. pressure of 12 MPa = 120 bar) and a low pressure part (pressure of approx. 0.6 MPa = 6 bar).

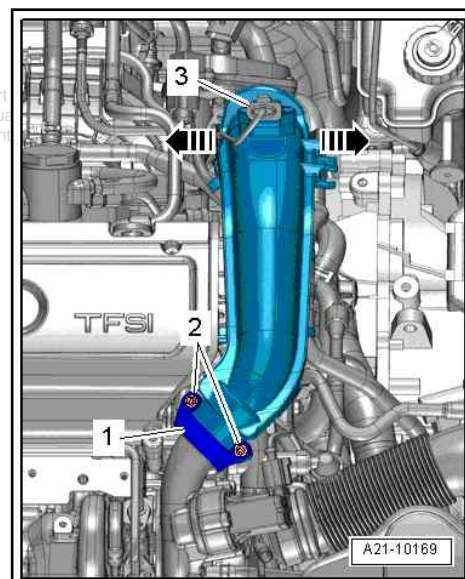
- ◆ *Before opening the high pressure system, e.g. removing the high pressure pump, the fuel distributor, the injection valves, the fuel pipes or the fuel pressure sender - G247-, the fuel pressure in the high pressure system with a remaining pressure of approx. 0.6 MPa (6 bar) must be reduced.*
- ◆ *The procedure for this is described in the chapter "Relieving pressure in the high pressure system"*
⇒ *"1.2 Reduce fuel pressure", page 269*.

- Remove engine cover
⇒ *"3.1 Removing and installing engine trim panel", page 48*.
- Unscrew screws -2- and remove retaining bracket -1-.
- Disconnect plug -3- at charge pressure sender - G31- with intake air temperature sender 2 - G299-.
- Unhook hoses from pressure pipe and open the cable guide.
- Press retaining clips -arrows- outwards and pull the pressure pipe out upwards.
- Then remove the pressure pipe from the exhaust gas turbo-charger.



Note

Hold the connections at the high pressure pump and at the bottom part of intake manifold/fuel distributor when tightening the union nuts with a wrench.



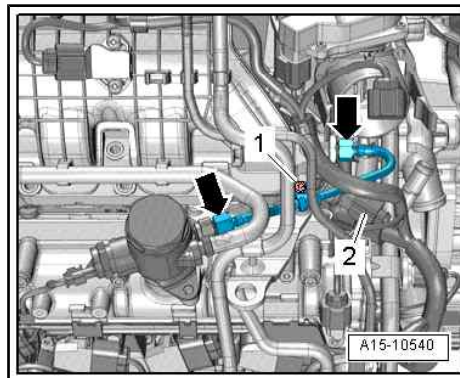


- Unscrew union nuts -arrows- and screw -1- and remove high pressure line.



Note

- ♦ *The fuel line bracket must not become bent in any circumstances.*
- ♦ *If the bracket becomes bent the fuel line must be replaced, as must the bracket.*

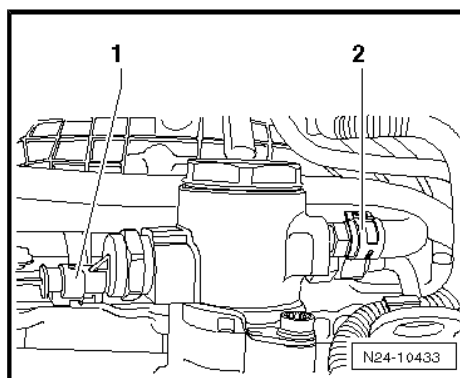


- Regulating plug -1- from the high pressure pump regulating valve - N276- and remove the fuel feed line -2- from the high pressure pump.

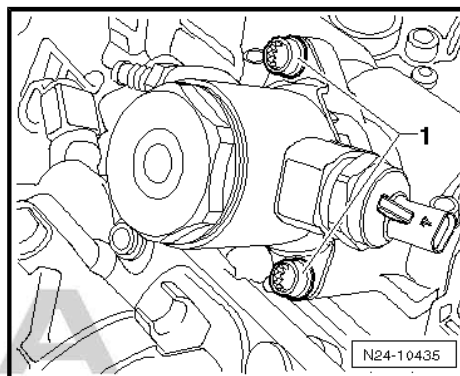


Note

Collect the fuel which flows out with a cloth.



- Unscrew fixing screws -1- uniformly.



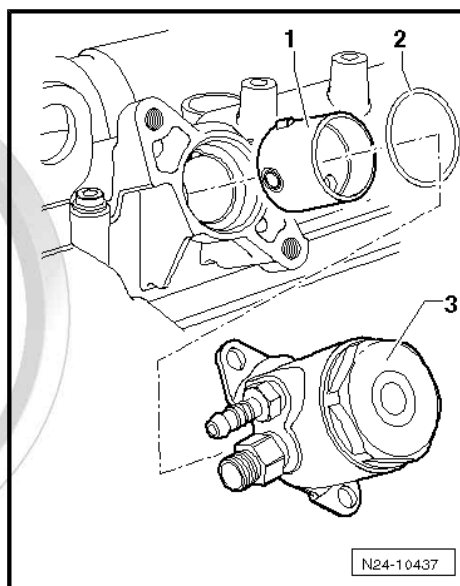
- Pull the high pressure pump -3- and the roller tappet -1- out of the camshaft housing.

Install



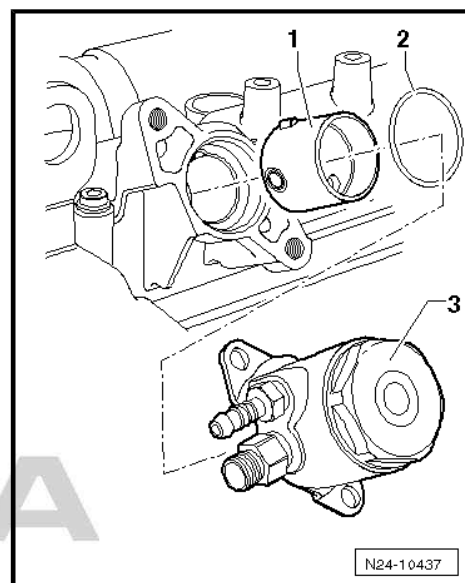
Note

- ♦ *Moisten the roller tappet of the high pressure pump with clean engine oil.*
- ♦ *Always replace the O-ring of the high pressure pump.*
- ♦ *The fixing screws for the high pressure pump must always be replaced.*

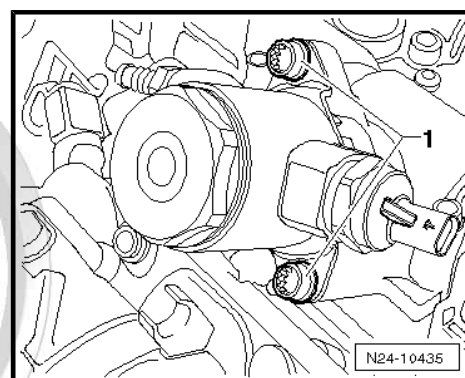


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- Slide the roller tappet -1- into the camshaft housing.
- Insert a new, oiled O-ring -2- into the slot of the high pressure pump -3-.
- Turn crankshaft until the roller tappet is at the bottom position.
- Position the high pressure pump -3- onto the camshaft housing.



- Insert new fixing screws -1- and screw in sufficiently until the bolt heads are positioned on the flange.
- Then tighten the fixing screws -1- evenly.



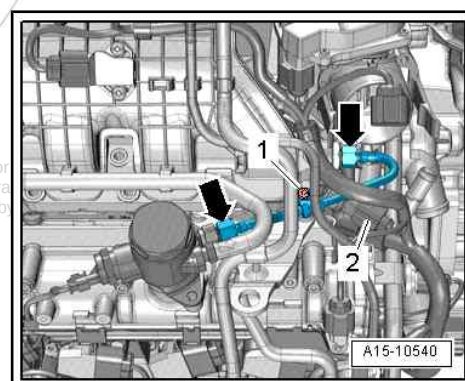
- Screw on the union nuts of the high pressure line -arrows- until hand-tight.
- Install bracket for fuel lines and tighten fixing screw -1-.



Note

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Hold the connection piece at the high pressure pump and at the bottom part of intake manifold/union nuts when tightening the union nuts with a wrench.



- Tighten the union nuts of the high pressure lines -arrows-.

Further installation occurs in reverse order.

Tightening torques

- ◆ ⇒ [“7.1 Summary of components - high pressure pump”, page 297](#)
- ◆ ⇒ [“4.1.2 Summary of components - intake manifold part II”, page 280](#)
- ◆ ⇒ [“3.1 Removing and installing engine trim panel”, page 48](#)

Component	Specified torque
Screws for bracket for the fuel lines	8 Nm

26 – Exhaust system

1 Exhaust pipe/silencer

⇒ [“1.1 Summary of components- silencer”, page 302](#)

⇒ [“1.2 Separating exhaust pipes, silencers”, page 306](#)

⇒ [“1.3 Aligning exhaust system free of stress”, page 306](#)

⇒ [“1.4 Inspecting the exhaust system for leaktightness”, page 308](#)

1.1 Summary of components- silencer

⇒ [“1.1.1 Summary of components - silencer \(Octavia II\)”, page 302](#)

⇒ [“1.1.2 Summary of components- silencer \(Superb II\)”, page 303](#)

⇒ [“1.1.3 Summary of components - silencer \(Yeti\)”, page 304](#)

⇒ [“1.1.4 Summary of components- silencer \(Rapid NH\)”, page 305](#)

1.1.1 Summary of components - silencer (Octavia II)

1 - Hanger

2 - Screw, nut

- ☐ Tightening torque of clamping sleeve
⇒ [page 308](#) .
- ☐ 23 Nm

3 - Middle part of exhaust system

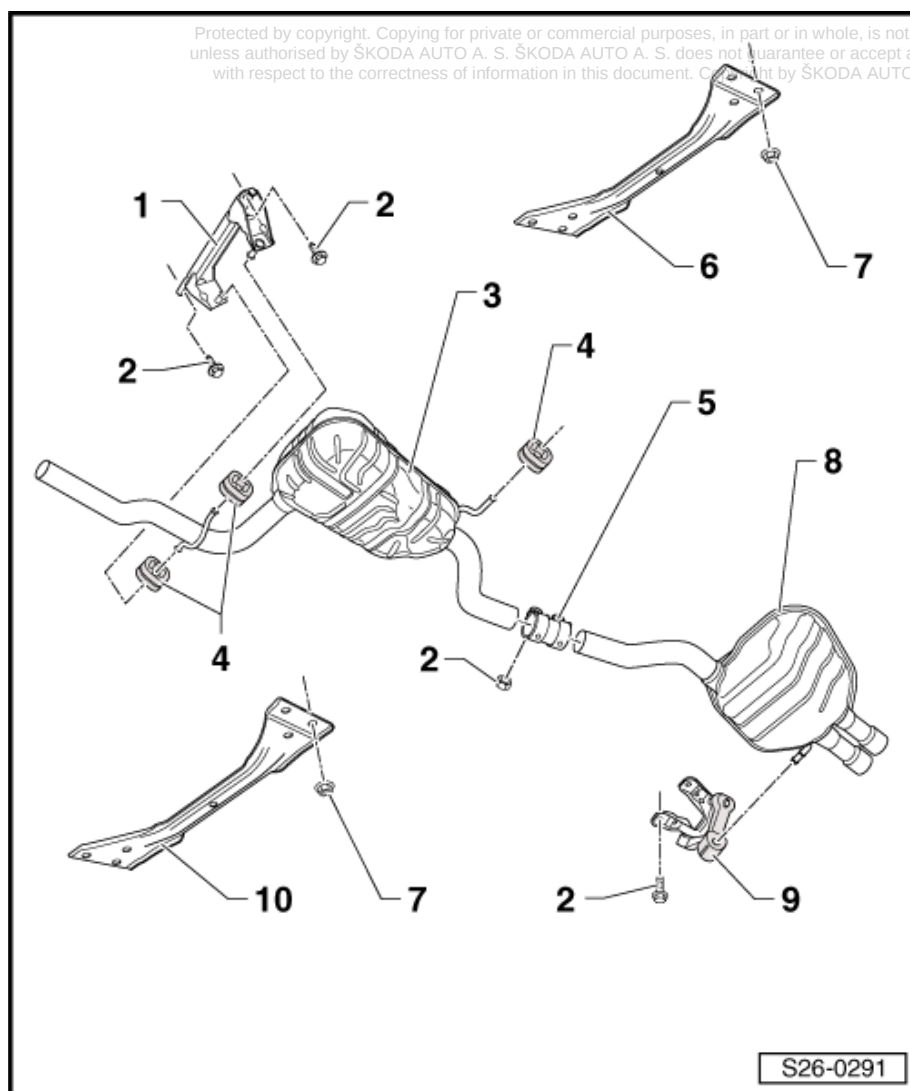
- ☐ for first equipment building unit with rear part of exhaust gas system, replace individually when carrying out repairs
- ☐ separate
⇒ [“1.2 Separating exhaust pipes, silencers”, page 306](#)

4 - Retaining strap

- ☐ replace if damaged

5 - Clamping sleeve

- ☐ for connecting middle or rear part of the exhaust system
- ☐ Fitting position
⇒ [“1.2 Separating exhaust pipes, silencers”, page 306](#)
- ☐ Tighten bolted connections evenly
- ☐ Tightening torque of clamping sleeve
⇒ [page 308](#) .



6 - Front tunnel bridge

7 - Nut

- ☐ 20 Nm

8 - Rear part of exhaust system

- ☐ for first equipment building unit with middle part of exhaust gas system, replace individually when carrying out repairs
- ☐ separate ➔ ["1.2 Separating exhaust pipes, silencers", page 306](#)

9 - Retaining strap

- ☐ replace if damaged

10 - Rear tunnel bridge

1.1.2 Summary of components- silencer (Superb II)

1 - Middle and rear part of the exhaust system

- ☐ replace complete when carrying out repairs
- ☐ Align exhaust system free of stress
➔ ["1.3 Aligning exhaust system free of stress", page 306](#)

2 - Retaining strap

- ☐ replace if damaged

3 - Unbolt bracket for exhaust pipe

- ☐ firmly riveted with the protection plate of the fuel tank

4 - Screw, nut

- ☐ 23 Nm

5 - Front tunnel bridge

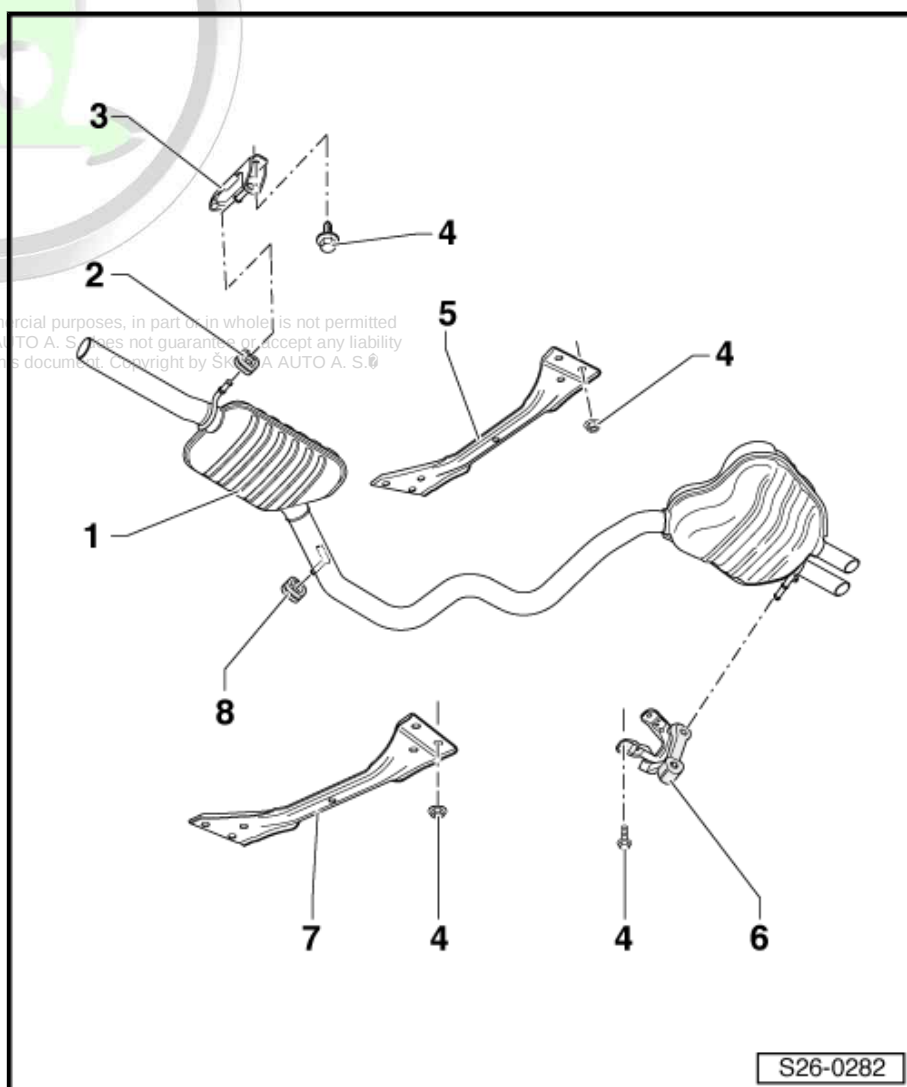
6 - Hanger

- ☐ replace if damaged

7 - Rear tunnel bridge

8 - Retaining strap

- ☐ replace if damaged





1.1.3 Summary of components - silencer (Yeti)

1 - Retaining strap

- ☐ replace if damaged

2 - Screw

- ☐ 23 Nm

3 - Hanger

4 - Middle part of exhaust system

- ☐ for first equipment building unit with rear part of exhaust gas system, replace individually when carrying out repairs
- ☐ separate
⇒ ["1.2 Separating exhaust pipes, silencers", page 306](#)

5 - Screw

- ☐ 23 Nm

6 - Hanger

7 - Retaining strap

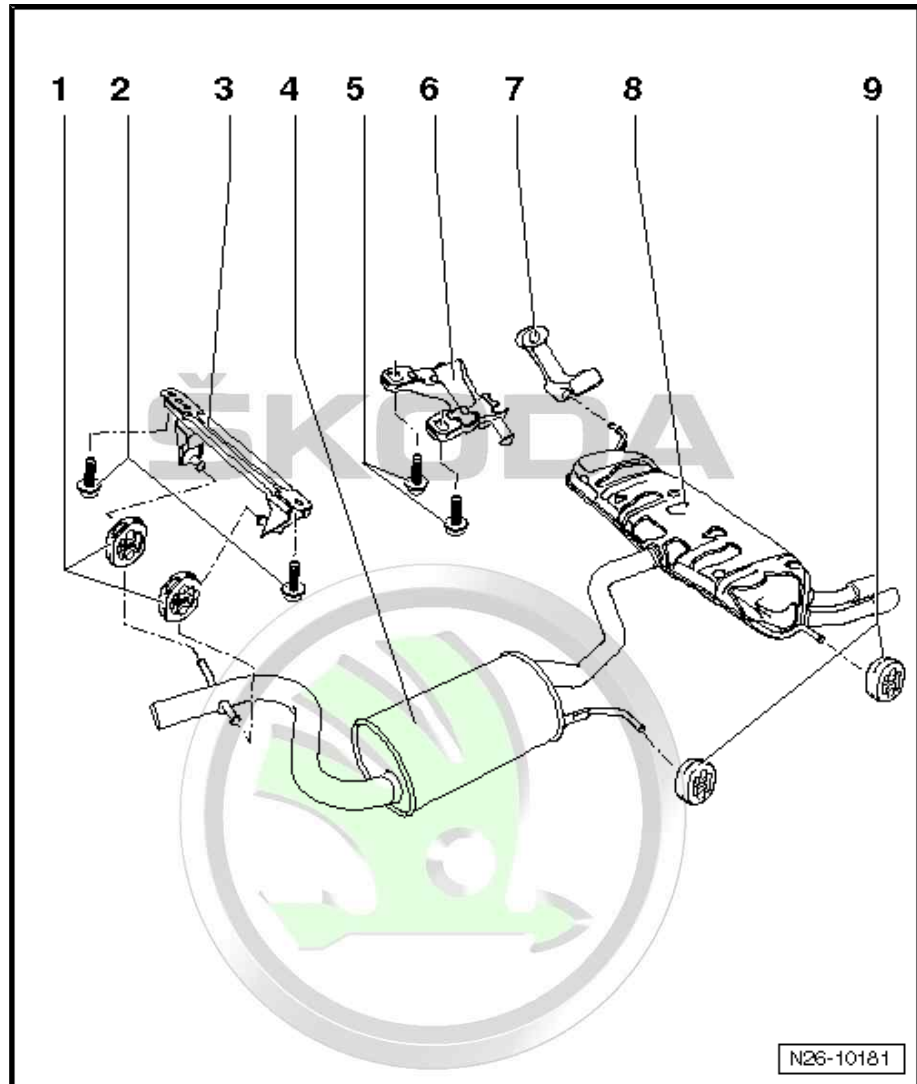
- ☐ replace if damaged

8 - Rear part of exhaust system

- ☐ for first equipment building unit with middle part of exhaust gas system, replace individually when carrying out repairs
- ☐ separate
⇒ ["1.2 Separating exhaust pipes, silencers", page 306](#)

9 - Retaining strap

- ☐ replace if damaged



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1.1.4 Summary of components- silencer (Rapid NH)

1 - Gasket

- ☐ replace

2 - Catalytic converter

- ☐ removing and installing
⇒ ["2.2 Removing and installing catalytic converter", page 311](#)

3 - Screw

- ☐ Replace after disassembly
- ☐ Tightening torque
⇒ ["2.1 Summary of components - exhaust gas cleaning", page 309](#)

4 - Nut

- ☐ Replace after disassembly
- ☐ Coat the bolts and screws of the catalytic converter with hot bolt paste ⇒ ETKA - Electronic Catalogue of Original Parts
- ☐ Tightening torque
⇒ ["2.1 Summary of components - exhaust gas cleaning", page 309](#)

5 - Retaining strap

- ☐ Observe part number ⇒ ETKA - Electronic Catalogue of Original Parts
- ☐ replace if damaged

6 - Front exhaust pipe

- ☐ with decoupling element
- ☐ do not twist decoupling element more than 10° - risk of damage
- ☐ Secure decoupling element with transport security - T10403-

7 - Clamping sleeve

- ☐ Tighten bolted connections evenly
- ☐ Tightening torque of clamping sleeve ⇒ [page 308](#) .

8 - Nut

- ☐ Tightening torque of clamping sleeve ⇒ [page 308](#) .

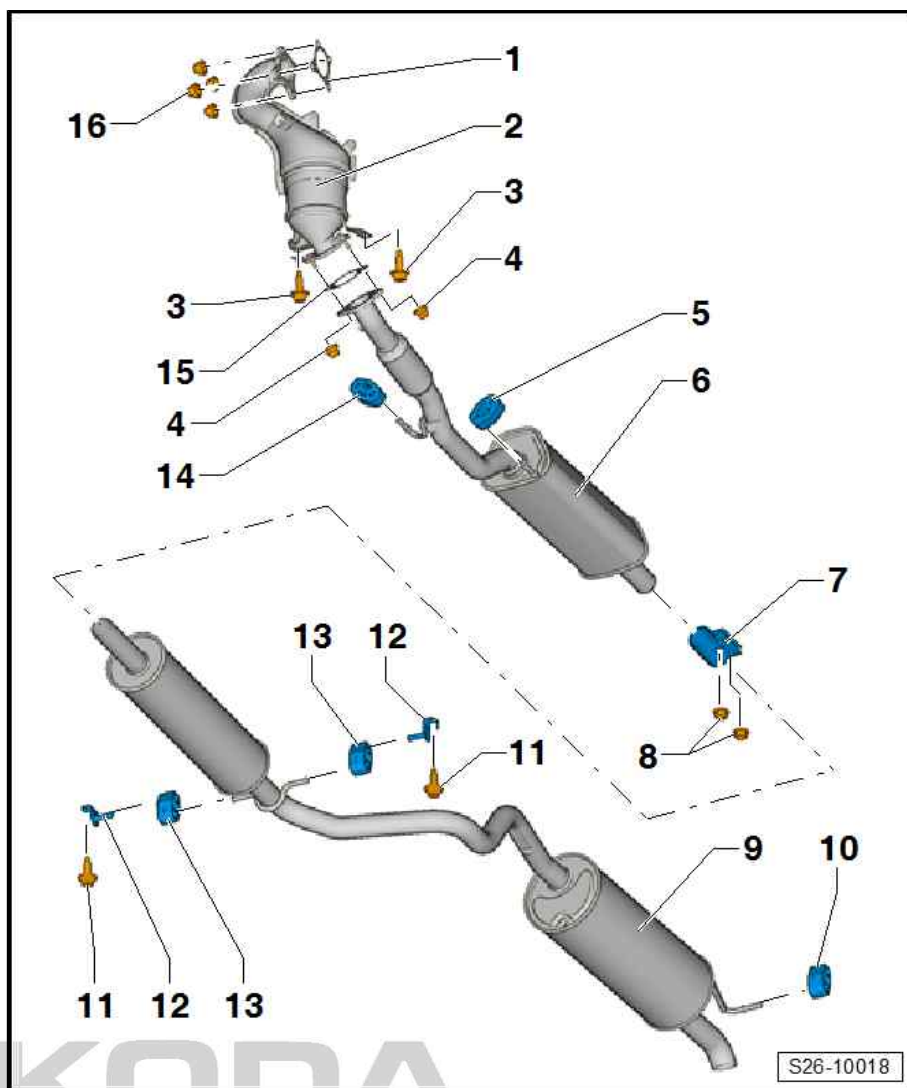
9 - Rear part of exhaust system

10 - Retaining strap

- ☐ Observe part number ⇒ ETKA - Electronic Catalogue of Original Parts
- ☐ replace if damaged

11 - Screw

- ☐ 20 Nm
- ☐ 23 Nm - only for Russia



12 - Bracket for the retaining strap

13 - Retaining strap

- ☐ Observe part number ⇒ ETKA - Electronic Catalogue of Original Parts
- ☐ replace if damaged

14 - Retaining strap

- ☐ Observe part number ⇒ ETKA - Electronic Catalogue of Original Parts
- ☐ replace if damaged

15 - Gasket

- ☐ Replace after disassembly

16 - Nut

- ☐ Replace after disassembly
- ☐ Coat the bolts and screws of the exhaust gas turbocharger with hot bolt paste ⇒ ETKA - Electronic Catalogue of Original Parts
- ☐ Tightening torque ⇒ ["2.1 Summary of components - exhaust gas cleaning", page 309](#)

1.2 Separating exhaust pipes, silencers

Special tools and workshop equipment required

- ◆ Body saw e.g. -V.A.G 1523A-
- ◆ Protective goggles



Note

- ◆ *For individually replacing the middle or rear part of the exhaust system, a separation point is provided in the connecting pipe.*
- ◆ *The separation point is marked by indentations on the circumference of the exhaust pipe.*



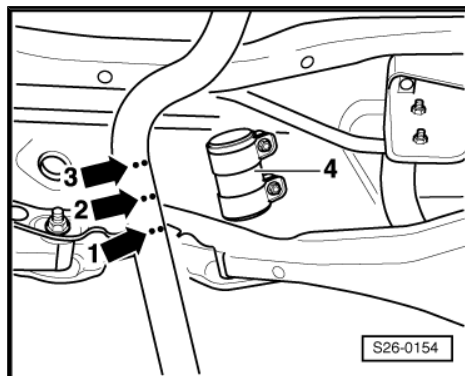
WARNING

In order to avoid injuries from metal swarfs, wear safety goggles and safety clothing.

- Disconnect exhaust pipe at the separation point -arrow 2- with body saw (right-angled).
- Position clamping sleeve -4- during installation at the lateral markings -arrow 1- and -arrow 3- and turn to the screw ends are positioned as far up as possible.
- Align rear part of exhaust system horizontally and tighten clamping sleeve -4- uniformly.
- Align exhaust system free of stress
⇒ ["1.3 Aligning exhaust system free of stress", page 306](#)

Tightening torques

- ◆ ⇒ ["1.3 Aligning exhaust system free of stress", page 306](#)



1.3 Aligning exhaust system free of stress

- The exhaust system is aligned when cold.

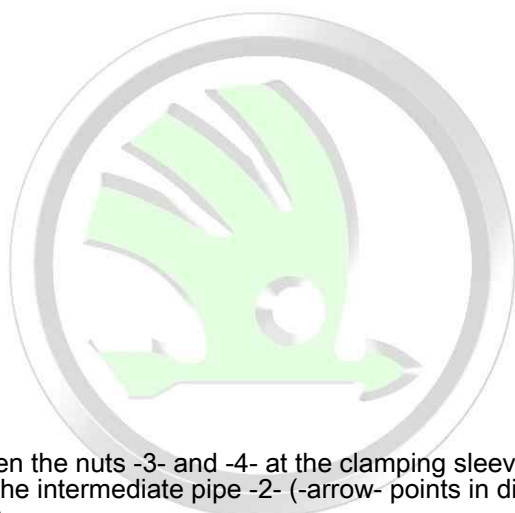
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i Note

Two variants of clamping sleeves can be fitted to the exhaust system.

Difference between clamping sleeves:

- ◆ Clamping sleeve -A-: 95 mm long
- ◆ Clamping sleeve -B-: 88 mm long



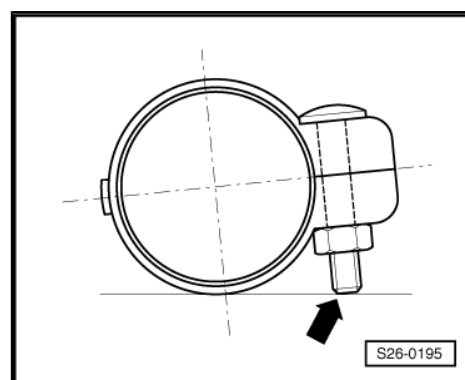
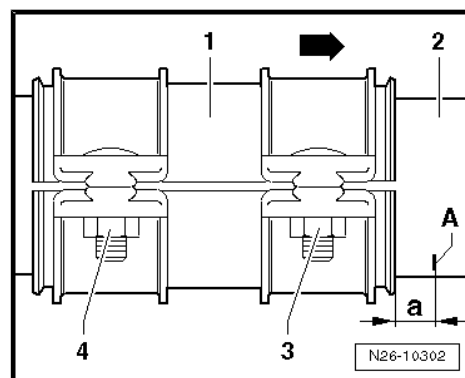
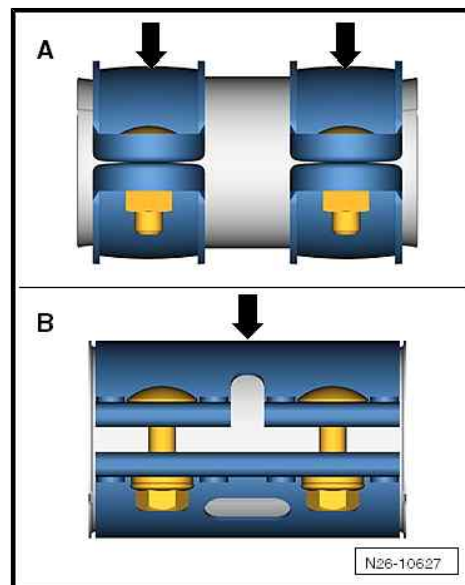
- Slacken the nuts -3- and -4- at the clamping sleeve -1- and align the intermediate pipe -2- (-arrow- points in direction of travel).

– Set the clamping sleeve at a distance -a- from the marking -A- on the pre-exhaust pipe.

- ◆ Dimension -a- for clamping sleeves version -A- = 5 mm
- ◆ Dimension -a- for clamping sleeves version -B- = 8.5 mm

The fixing screws must be located on the right. The screws must not protrude beyond the bottom edge of the clamping sleeve.

- Tighten the front nut by hand.

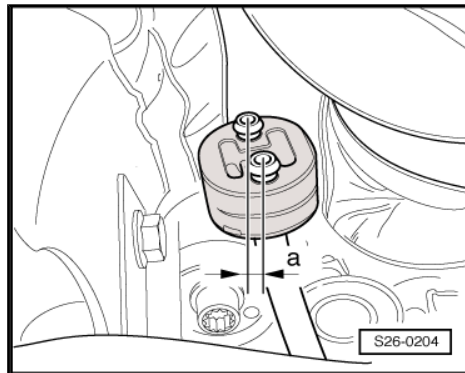




- Push exhaust system forward until the following dimension is reached between hanger/body and hanger/centre part of the exhaust system:
- ◆ Octavia II, Superb II, Rapid NH -a-: 7 ... 9 mm
- ◆ Yeti -a-: 9 ... 11 mm
- Tighten screws of clamping sleeve evenly.

Tightening torques

Component	Specified torque
Clamping sleeve version -A-	23 Nm
Clamping sleeve version -B-	30 Nm

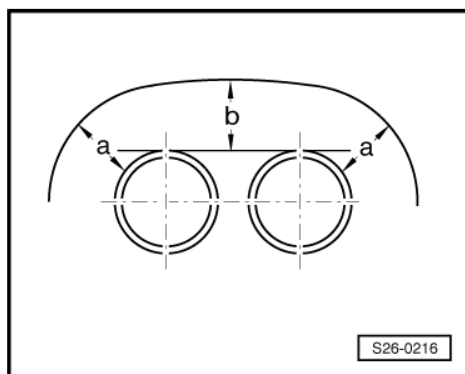


Align double pre-exhaust pipe

- Align rear part of exhaust system.
- There must be an equal distance -a- between bumper opening and exhaust tailpipe.
- The distance -b- from the bumper opening to the exhaust tailpipes is equal.

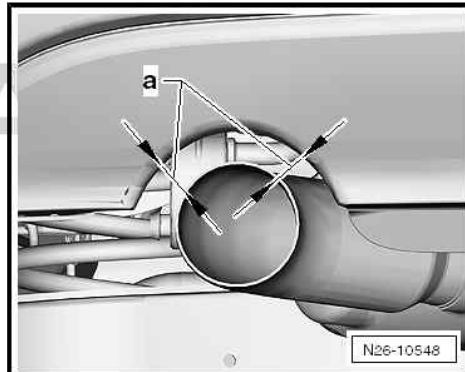
For centering, if necessary the hangers of the exhaust system must be loosened.

Align exhaust tailpipe



- Align rear part of exhaust system.
- There must be an equal distance -a- between bumper opening and exhaust tailpipe.

For centering, if necessary the hangers of the exhaust system must be loosened.



1.4 Inspecting the exhaust system for leak-tightness

- Start engine and run in idle.
- Seal off exhaust tailpipes for the duration of the leak check (e.g. with cloth or plug).
- Inspect connection points of cylinder head/exhaust manifold, exhaust gas turbocharger/exhaust pipe etc. for tightness by listening and visual inspection.
- Eliminate any leak found.

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2 Cleansing exhaust emissions

⇒ ["2.1 Summary of components - exhaust gas cleaning", page 309](#)

⇒ ["2.2 Removing and installing catalytic converter", page 311](#)

2.1 Summary of components - exhaust gas cleaning

1 - Screw

- ☐ first of all screw in all fixing screws by hand when installing
- ☐ 10 Nm

2 - Gasket

- ☐ Replace after disassembly

3 - Intermediate pipe

- ☐ Only for Octavia II, Superb II and Yeti

4 - Clamping sleeve

- ☐ Tighten bolted connections evenly
- ☐ Tightening torque
⇒ [page 308](#)

5 - Nut

- ☐ Replace after disassembly
- ☐ Coat the bolts and screws of the exhaust pipe with hot bolt paste
⇒ ETKA - Electronic Catalogue of Original Parts
- ☐ Only for Octavia II, Superb II and Yeti
- ☐ 23 Nm

6 - Lambda probe after catalytic converter - G130-

- ☐ the thread of new lambda probes must be coated with assembly paste
- ☐ for re-used lambda probe, only coat the thread with hot bolt paste ⇒ ETKA - Electronic Catalogue of Original Parts ; the paste must not get into the slots of the probe body
- ☐ 50 Nm

7 - Hanger

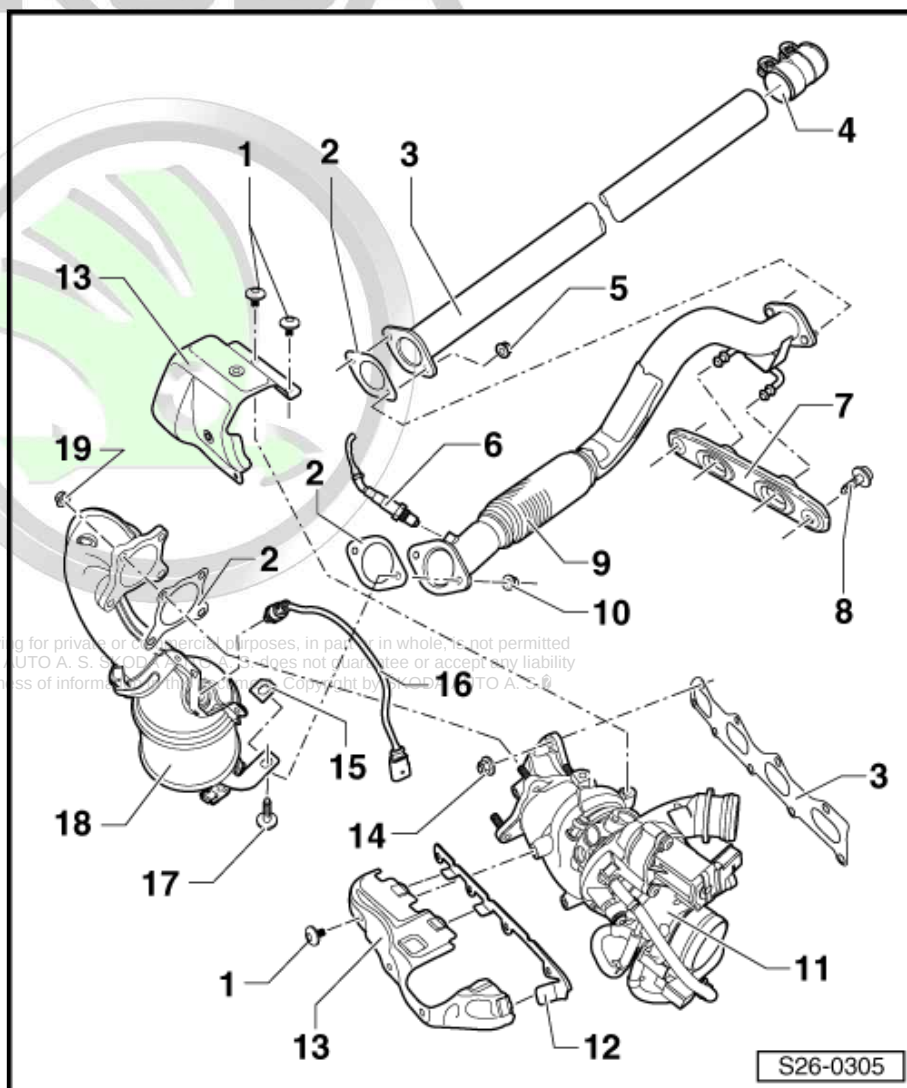
- ☐ Only for Octavia II, Superb II and Yeti

8 - Screw

- ☐ Only for Octavia II, Superb II and Yeti
- ☐ 23 Nm

9 - Front exhaust pipe

- ☐ with decoupling element
- ☐ do not twist decoupling element more than 10° - risk of damage
- ☐ Secure decoupling element with transport security - T10403-





- ☐ Only for Octavia II, Superb II and Yeti

10 - Nut

- ☐ Replace after disassembly
- ☐ 23 Nm

11 - Exhaust turbocharger with exhaust manifold

- ☐ Removing and installing exhaust gas turbocharger
⇒ ["1.2.1 Removing and installing the exhaust gas turbocharger with exhaust manifold", page 238](#)
- ☐ Disconnect the exhaust gas turbocharger from the exhaust manifold
⇒ ["1.2.2 Removing and installing the exhaust gas turbocharger from exhaust manifold", page 243](#)

12 - Support

13 - Heat shield

14 - Nut

- ☐ Replace after disassembly
- ☐ Coat the bolts and screws of the exhaust manifold with hot bolt paste ⇒ ETKA - Electronic Catalogue of Original Parts
- ☐ 25 Nm

15 - Reinforcing clip

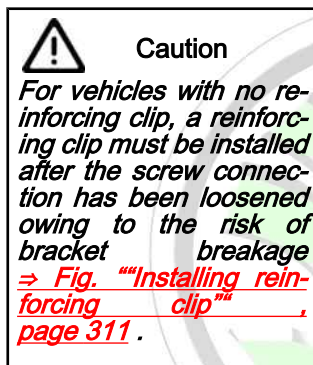
- ☐ installing ⇒ [Fig. "Installing reinforcing clip", page 311](#)

16 - Lambda probe - G39-

- ☐ the thread of new lambda probes must be coated with assembly paste
- ☐ for re-used lambda probe, only coat the thread with hot bolt paste ⇒ ETKA - Electronic Catalogue of Original Parts the paste must not get into the slots of the probe body
- ☐ 50 Nm

17 - Screw

- ☐ Replace after disassembly



- ☐ 23 Nm

18 - Catalytic converter

- ☐ removing and installing ⇒ ["2.2 Removing and installing catalytic converter", page 311](#)

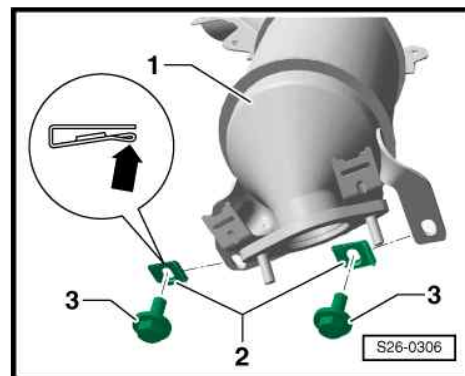
19 - Nut

- ☐ Replace after disassembly
- ☐ Coat the bolts and screws of the exhaust gas turbocharger with hot bolt paste ⇒ ETKA - Electronic Catalogue of Original Parts
- ☐ 23 Nm

Installing reinforcing clip

- Fit reinforcing clip -2- as shown in the illustration onto the catalytic converter brackets -1-.
- The »folded edge« -arrow- must be pointing downwards.

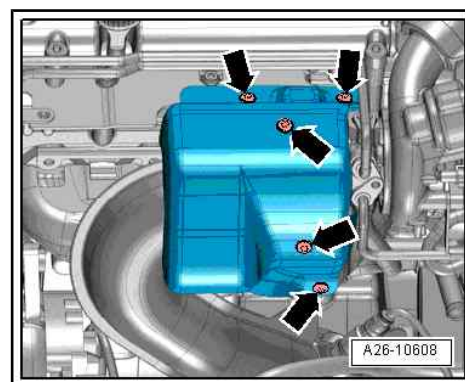
Use new screws -3- with a larger contact surface ⇒ ETKA - Electronic Catalogue of Original Parts .



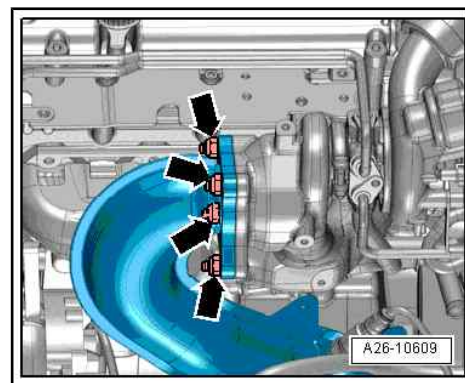
2.2 Removing and installing catalytic converter

Removing

- Unscrew screws -arrows- and remove exhaust gas turbo-charger heat shield.



- Unscrew catalytic converter nuts -arrows-.
- Expose electrical wiring loom to the generator on the catalytic converter.
- Remove V-ribbed belt
⇒ ["1.3 Removing and installing V-ribbed belt", page 54](#) .



Vehicles with air conditioning



WARNING

Risk of injury through refrigerant.

- ◆ **Do not open the refrigerant circuit of the air conditioning system.**

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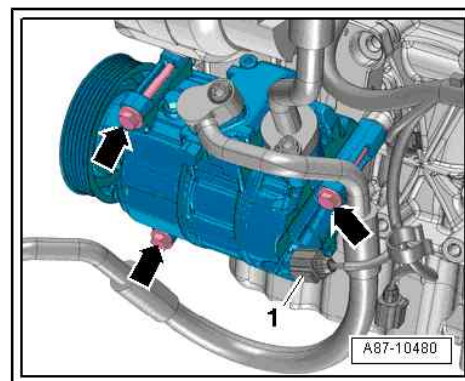
- Disconnect electric plug connection -1- on the control valve for the air conditioning system - N280- compressor.
- Release screws -arrows- for AC compressor.



Caution

Risk of damaging AC compressor, refrigerant lines and hoses.

- ◆ **Do not over-tension, buckle or bend refrigerant lines and hoses.**



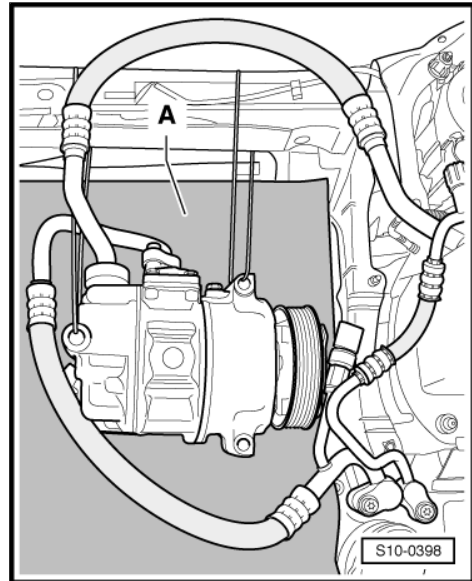


- Secure AC compressor to the lock carrier with connected hoses. Insert a sheet of cardboard -A- when doing so to protect the radiator.



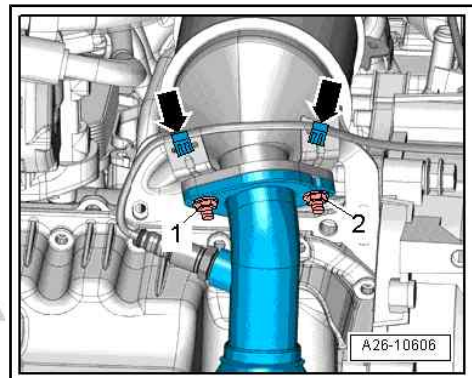
Note

- ♦ Risk of damaging the decoupling element.
- ♦ Do not bend decoupling element on pre-exhaust pipe by more than 10°.
- ♦ Secure decoupling element with transport security - T10403-

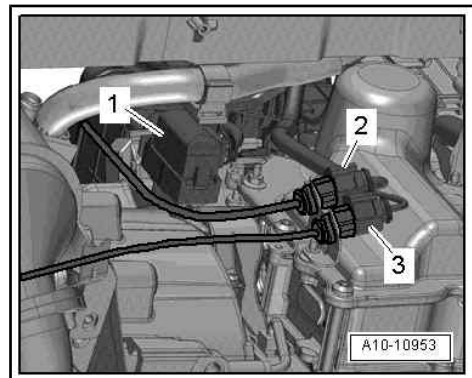
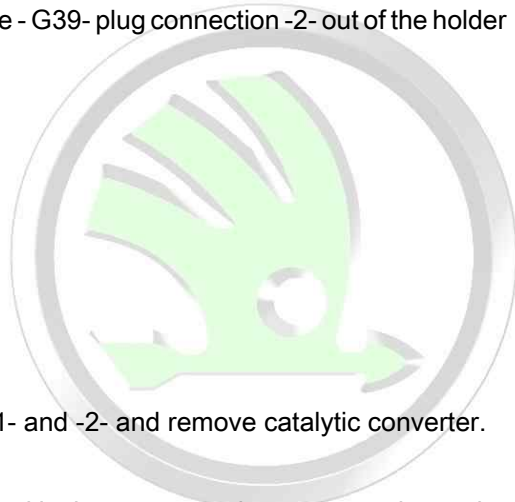


- Unscrew nuts -1- and -2-.
- Expose electrical wiring loom for lambda probe after catalytic converter - G130- -arrows-.
- Remove the pre-exhaust pipe from the catalytic converter:

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- Take lambda probe - G39- plug connection -2- out of the holder and disconnect.

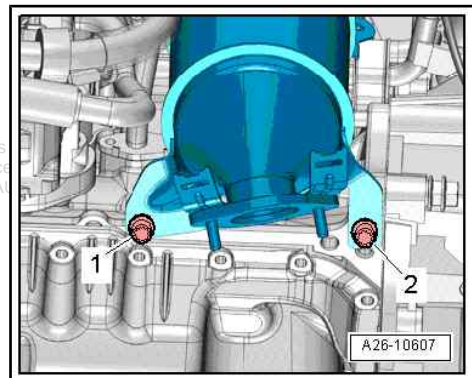


- Release screws -1- and -2- and remove catalytic converter.

Install

Installation is performed in the reverse order, pay attention to the following points:

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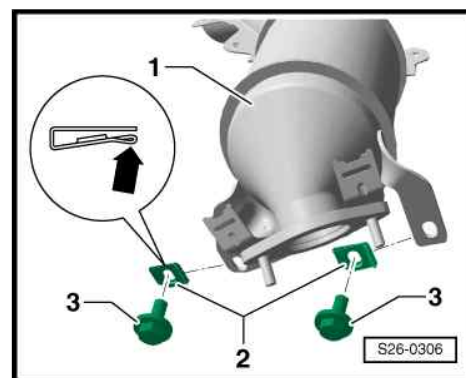


- Fit reinforcing clip -2- as shown in the illustration onto the catalytic converter brackets -1-.
- The »folded edge« -arrow- must be pointing downwards.

Use new screws -3- with a larger contact surface ⇒ ETKA - Electronic Catalogue of Original Parts .

Tightening torques

- ◆ ⇒ ["2.1 Summary of components - exhaust gas cleaning", page 309](#)
- ◆ AC compressor ⇒ Heating, Air Conditioning; Rep. gr. 87



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28 – Ignition system

1 Ignition system

⇒ [“1.1 Assembly overview - ignition system”, page 314](#)

⇒ [“1.2 Removing and installing ignition coils with output stage”, page 315](#)

⇒ [“1.3 Removing and installing engine speed sender G28”, page 316](#)

1.1 Assembly overview - ignition system

1 - Spark plug

- ☐ use spark plug wrench e.g. -3122 B- for removing and installing
- ☐ When installing new spark plugs, grease the ignition coils with power output stage Pos. -3- with lubricating paste - G 052 141 A2-
⇒ [“1.2 Removing and installing ignition coils with output stage”, page 315](#)

☐ Change interval:

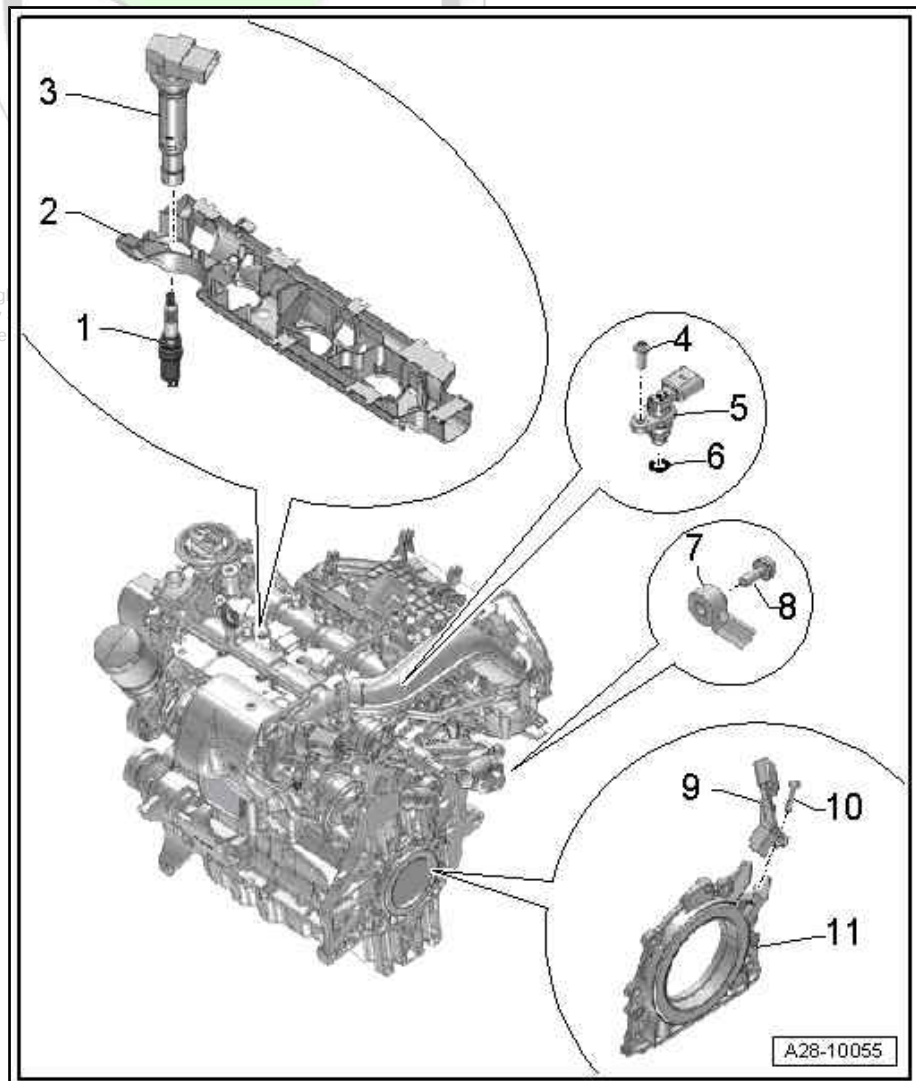
- ◆ ⇒ Maintenance ; Booklet Octavia II
- ◆ ⇒ Maintenance ; Booklet Superb II
- ◆ ⇒ Maintenance ; Booklet Yeti
- ◆ ⇒ Maintenance ; Booklet Rapid NH
 - ☐ Observe part number ⇒ Electronic Catalogue of Original Parts “ETKA”
 - ☐ 25 Nm

2 - Cable guide

- ☐ screwed onto the camshaft housing
- ☐ 5 Nm

3 - Ignition coil with a power output stage

- ◆ Ignition coil 1 with output stage - N70-
- ◆ Ignition coil 2 with output stage - N127-
- ◆ Ignition coil 3 with output stage - N291-
- ◆ Ignition coil 4 with output stage - N292-
 - ☐ removing and installing ⇒ [“1.2 Removing and installing ignition coils with output stage”, page 315](#)
 - ☐ When installing new spark plugs, grease the ignition coils with power outage stage with fitting compound - G 052 141 A2-



4 - Screw

- ☐ 10 Nm

5 - Hall sender - G40-

6 - O-ring

- ☐ replace if damaged

7 - Knock sensor 1 - G61-

8 - Screw

- ☐ the tightening torque influences the knock sensor function
- ☐ 20 Nm

9 - Engine speed sender - G28-

- ☐ removing and installing ⇒ [“1.3 Removing and installing engine speed sender G28”, page 316](#)

10 - Screw

- ☐ 5 Nm

11 - Sealing flange on the gearbox side

- ☐ removing and installing
⇒ [“2.3 Removing and installing the sealing flange on the gearbox side”, page 65](#)

1.2 Removing and installing ignition coils with output stage

Special tools and workshop equipment required

- ◆ Assembly tool - T10118-
- ◆ Extractor - T10094A-



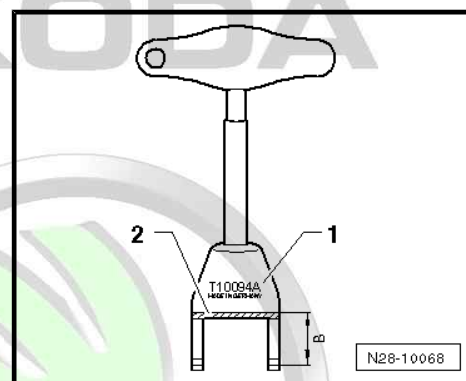
Note

The housing of the ignition coil with power output stage has been changed. For this reason these ignition coils can only be removed and installed using the extractor - T10094A-. The former extractor - T10094- can still be used if the work is carried out as described.

- Machine the marked area -2- to the new nominal dimension -B- to 18 mm using appropriate workshop equipment
- Also mark tool designation with the letter “A” -1-.

Removing

- Remove engine cover
⇒ [“3.1 Removing and installing engine trim panel”, page 48](#) .

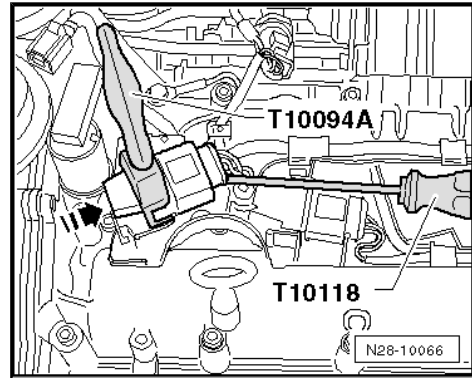




- Position extractor - T10094A- onto the ignition coil with power output stage -arrow-.
- Slightly pull out the ignition coil with power output stage.
- Position the assembly tool - T10118- as shown.
- Carefully unlock the plug lock and disconnect the plug.

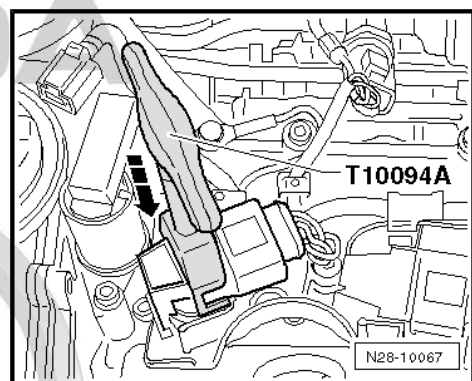
Install

- Insert all ignition coils loosely into the relevant spark plug shaft.
- Align the ignition coils to the plug connections.
- Push connector onto the ignition coil with power output stage until it audibly locks into place.
- Position extractor - T10094A- onto the ignition coil with power output stage.
- Press the ignition coil with power output stage into the cylinder head -arrow-.



Tightening torques

- ♦ ➔ [“3.1 Removing and installing engine trim panel”, page 48](#)



1.3 Removing and installing engine speed sender - G28-

Special tools and workshop equipment required

- ♦ Socket insert - T10370-

Removing

The fitting location of the engine speed sender - G28- is located below the intake manifold at the sealing flange on the gearbox side.

- Disconnect plug -1- from the engine speed sender - G28-.
- Take out the gasket -2- from the cylinder block and remove the engine speed sender - G28- with the socket insert - T10370-.

Install

- Install engine speed sender - G28- and tighten the fixing screw to 5 Nm.

Further installation occurs in a similar way in reverse order to removal.

Tightening torques

- ♦ ➔ [“1.1 Assembly overview - ignition system”, page 314](#)

